THE MEDICAL NEWS.
A WEEKLY JOURNAL OF MEDICAL SCIENCE.
VOL. 82. NEW YORK, SATURDAY, MAY 2, 1903. No. 18.

ORIGINAL ARTICLES.

INDICATIONS FOR EXTIRPATION OF THE GALL-BLADDER.

BY MAURICE H. RICHARDSON, M.D.,
OF BOSTON;
VISITING SURGEON, MASSACHUSETTS GENERAL HOSPITAL.

THE so-called ideal operation upon the gall-bladder, by which that viscus is immediately closed after the removal of gall-stones, seemed, when first proposed, an effectual and permanent method, making the tedious process of drainage unnecessary and the firm closure of the abdominal incision possible. It was, however, soon demonstrated by the most experienced observers that the essential thing in most if not in all biliary affections is drainage of the biliary passages. When, furthermore, it appeared that immediate closure of the gall-bladder might be followed by grave disaster, ideal cholecystotomy was regarded first with suspicion, and finally with well-merited disapproval. Indeed, the operation has no longer any place in the surgery of the gall-bladder.

In the beginning of one's experience in the surgical treatment of gall-stones removal of the gall-bladder by destroying at a single blow the *fons et origo mali* seems a very efficacious and satisfactory procedure. As one's experience broadens, however, it is seen that in reality removal of the gall-bladder is an operation which has distinct limitations; that, no matter how advantageous this operation may be in theory, in practice it has disadvantages, immediate and remote, which require careful consideration.

At the present time observers differ widely as to the best methods of procedure in these biliary affections which involve, directly or indirectly, the gall-bladder. Some whose opinions I respect very highly have advocated extirpation of the offending gall-bladder as a routine operation, just as they would advise extirpation of the appendix; but I have reserved the operation of cholecystectomy for cases in which the gall-bladder has in itself attributes which sooner or later threaten life. I may, however, in time become convinced that in all cases of gall-stone disease the best treatment will be to remove the gall-bladder with the gall-stones. At present, for reasons which I shall give in detail, my tendency, though perhaps on the whole toward more frequent resort to cholecystectomy, is decidedly against the universal application of that remedy. The analogy between the gall-bladder and the appendix is not complete: the one has a definite and evident physiological purpose; the other, if it has a physiological function, has one that is neither evident nor definite. The one is a receptacle for an aseptic secretion; the other contains material which, normal or abnormal, is highly septic and infectious. The one can serve a useful physiological purpose after being operated upon; the other cannot. The one permits operations upon itself of great benefit to communicating structures; the other permits no operation upon itself except total destruction. The one is seldom in itself suddenly menacing to life; the other is frequently so.

Feeling considerable uncertainty as to the best method of procedure under varying conditions of disease affecting the biliary apparatus, I have undertaken to present the arguments, based upon theory and upon experience, which now influence my decision whenever the question of extirpating a gall-bladder arises. I have no doubt that within the next few years the accumulated experience —which undoubtedly will be great, now that the advisability of operating early upon offending gall-stones is generally admitted—will have led to as well-defined opinions as those of the past few years in reference to the treatment of the offending appendix. No satisfactory decision of the questions relating to extirpation or non-extirpation of the gall-bladder can be reached until we know, by the lapse of sufficient time, the comparative late effects of both. The end-results in simple cholecystotomy are certainly as gratifying as end-results have ever been in any class of abdominal operations. The remote effects of cholecystectomy must indeed be extraordinary to improve upon those of cholecystotomy.

Advantages of Cholecystectomy.—(*a*) The wound heals immediately, and the liability to hernia is therefore slight; (*b*) there is no possibility of gall-stones forming in the gall-bladder; (*c*) there is no possibility of a subsequent cholecystitis; (*d*) there is no possibility of malignant growths starting in the gall-bladder; (*e*) the formation of adhesions is reduced to a minimum.

Disadvantages of Cholecystectomy.—(*a*) There is no possibility of draining the biliary passages, except through one of the ducts, and that only after a difficult and unsatisfactory operation; (*b*) there is greater danger in the operation; (*c*) redrainage of the biliary passages is extremely difficult and dangerous.

Advantages.—(*a*) *The wound heals immediately, and the liability to hernia is therefore slight.* —The tendency to hernia in wounds high up in the abdomen is less than in those of the lower half. I have seen, however, very large hernias in the abdominal scar after cholecystotomy and drainage. The liability to hernia is greater when the drain is left at the lower angle of the wound than when it is left at the upper angle or in the center; it is less when the cut is made through the rectus than when it is made across the oblique muscles. In all operations, even when the gall-bladder is

* Read at the Meeting of the Southern Surgical and Gynecological Association, at Cincinnati, Nov., 1902.

extirpated, I use a gauze wick for two or three days. Strictly speaking, therefore, the wound is not immediately closed. Nor, in fact, is it completely closed, for I use no buried suture at the upper angle. The wound, nevertheless, closes practically by first intention after aseptic cholecystectomy, and hernia is decidedly infrequent. In other words, the tendency to hernia is reduced to a minimum.

If it were safe to close the abdominal wound after cholecystectomy, then immediate closure, with every possible precaution against hernia, might be practised. Unfortunately, bile frequently escapes from the depths of the wound, even if the cystic duct has been isolated and tied. A drain, preferably of gauze wrapped in rubber pellicle or tissue, is essential; for there is no telling when there may be an escape of bile from the pedicle of the gall-bladder.

(*b*) *There is no possibility of gall-stones forming in the gall-bladder.*—That there is no possibility of the re-formation of gall-stones after cholecystectomy cannot be maintained. Nevertheless, the formation of gall-stones elsewhere than in the gall-bladder itself is extremely unusual. In the cases in which no stones are found except in the common duct, the original source of the stones is, of course, uncertain, though a history of gall-stone colic without jaundice, preceding the jaundice of final impaction, indicates the gall-bladder as the seat of origin.

Two cases have recently come under my care which illustrate the possibilities of gall-stone formation in the hepatic duct. In the first case the gall-bladder, the cystic, the hepatic, and the common duct were enormously distended with gall-stones—three hundred in number. The gall-bladder and the cystic duct were emptied through the fundus; the common and hepatic through the common duct. The common and hepatic ducts were as large as the gall-bladder. Gall-stones were removed from the hepatic duct as far as the instruments could be inserted. All were, we supposed, removed. Drainage was made through the gall-bladder, the wound in the common duct being securely and successfully sutured. The patient, after a stormy convalescence, during which 150 gall-stones were discharged through the gall-bladder, made a good recovery.

In another case I removed three gall-stones, two of which were in the common duct and one high up in the hepatic. This patient had been operated upon six months previously by another surgeon, who drained the gall-bladder for cholecystitis, but found no stones. The patient had been jaundiced off and on for two years, with typical attacks of gall-stone colic. In this case the gall-stones probably formed in the gall-bladder, and were retained in the common duct. The impaction of one stone was followed by dilatation of the common and hepatic ducts, where the two other stones had room enough to pass upward into the liver or downward until they touched the impacted stone.

As the chief etiological factor in the production of gall-stones are micro-organisms, upon which or upon the products of which biliary salts are deposited, it is reasonable to conclude that where infections exist gall-stones may form. It is only in the gall-bladder, however, that infectious products remain long enough for the deposit of cholesterin and lime salts. They stagnate there, and permit the deposit of solid material. In the biliary stream of the hepatic ducts these products do not remain long enough to permit the formation of stones, unless diverticula exist in which the bile remains motionless long enough to allow the nucleus of a stone to form. Even then the constantly increasing diameter of the hepatic radicles offers no obstruction to the disentanglement and the floating away of the small calculus. There is every reason, in theory and in practice, for thinking that the hepatic and the common ducts are but rarely the seat of origin in gall-stones.

It may be assumed, therefore, that practically all gall-stones are formed in the gall-bladder; and that, once the gall-bladder has been removed, the chance of re-formation is extremely small. But is not the chance of re-formation in the gall-bladder after drainage extremely small? It certainly is small—just how small it would be hard to say. Assuming that the etiology of gall-stones requires first an infection of bile, the probability of re-formation would be less than in the first instance; for a second infection would require a fresh source of micro-organisms, and, moreover, there would be fewer years of life in which to incur that infection. On the chances, a second cholelithiasis would be highly improbable. In the patients operated upon for gall-stones by cholecystotomy and drainage the subsequent history has been one of freedom from pain and other evidence of gall-stones. In the one or two cases in which there have been attacks of pain suggesting gall-stones, the gall-bladder had been opened and immediately closed—there had been no drainage of the biliary passages. The great advantage of drainage is the thorough cleansing of the biliary passages of all abnormal elements which might serve as nuclei for the deposit of biliary salts. And yet it seems not unreasonable to suppose that, in the gradual closure of the gall-bladder opening, some at least of these abnormal elements must at the last moment be retained in the gall-bladder and be gotten rid of through the normal channels.

Practical experience goes to show that the recurrence of gall-stones after cholecystotomy is very unusual, unless ligatures or sutures remaining in the gall-bladder wall are cast off into the gall-bladder. I have heard of but one such case—that reported by the late Dr. Homans.

Whatever may be the possibility of gall-stone formation in the hepatic radicles, there is certainly none in the usual nidus of gall-stones—the gall-bladder—after removal of that viscus.

(*c*) *There is no possibility of a subsequent cholecystitis.*—This is a distinct advantage in cholecystectomy. The occurrence of infections

after the removal of stones, and drainage, must be admitted. In some instances it becomes necessary to drain a second time. I have never found fresh gall-stones at the second operation, though I have in several instances found a stone impacted in the cystic duct. In several of my operations for cholecystitis (See *American Journal of the Medical Sciences*, June, 1898) the patient's condition was too serious to permit more than the briefest possible manipulations for drainage. Experience since the publication of that paper has convinced me that gall-stones are almost invariably the exciting cause of cholecystitis, and that careful search for gall-stones will usually result in their detection. Reinfections of a gall-bladder which was not at the time of operation in an infected condition is extremely unusual. If reinfections do occur in any considerable number of cases, it must be only a question of time when gall-stones will re-form.

The remote results after drainage of an infected gall-bladder are brilliant, even if the gall-bladder has been the seat of repeated infections. The prolonged drainage of infected gall-bladders, usually made necessary in the process of closure, seems, with the removal of gall-stones and the products of germ life, to produce not only a complete restoration of the gall-bladder to the normal, but to exert a permanent curative influence. It would, nevertheless, seem contrary to common sense that an inflamed gall-bladder, perhaps thickened and more or less contracted, should be made by drainage as free from the danger of renewed infections as the normal or the comparatively normal gall-bladder. It is the danger of these subsequent possibilities of acute gall-bladder disease which inclines me toward a total extirpation when in doubt.

(*d*) *There is no possibility of malignant growths starting in the gall-bladder.*—The irritation of gall-stones, or of chronic inflammations dependent upon or accompanying gall-stones, is undoubtedly a prolific source of malignant disease of the gall-bladder, the frequency of which is well known. This danger is a distinct and favorable indication for cholecystectomy whenever there is evidence at the time of operation that extensive inflammatory changes, unlikely to subside under drainage, have already taken place. Whenever a gall-bladder presents the least evidence of a new growth it should be removed; when it is so thickened and contracted as to make complete recovery under drainage unlikely it should also be removed.

(*e*) *The formation of adhesions is reduced to a minimum.*—Permanent fixation of the gall-bladder to the abdominal wall is sure to follow whenever suturing of the fundus is one of the steps of cholecystotomy. Various unpleasant sensations have been attributed to this cause. Chief among these discomforts has been a sensation of pulling or dragging. My experience has been, almost without exception, that no such results follow fixation of the gall-bladder. All my earlier operations were performed by suturing the gall-bladder to the edges of the abdominal wound. Of late years I have given up suturing entirely. Drainage is accomplished and maintained by fastening a large rubber drainage tube into the gall-bladder by means of a purse-string suture of silk. This method proves satisfactory, and is chosen because it is more rapid and it prevents absolutely the escape of bile, either into the abdomen, the wound, or the dressing.

Whatever method of cholecystotomy is used, adhesion of the fundus to the abdominal wall, or near it, is sure to follow. Moreover, adhesions to surrounding viscera are almost sure to form. I have operated a second time in quite a number of cases of cholecystotomy and I have found, as a rule, the gall-bladder adherent. In a great many cases of gall-stones the gall-bladder is found at the first operation everywhere adherent. Separation of these adhesions is always followed by renewed adhesions, and yet the adhesion in itself is as a rule productive of no discomfort, as far as the gall-bladder is concerned. It is true that adhesions to the pylorus and duodenum may at times seriously interfere with digestion; but adhesions of gall-bladder *per se* seldom cause discomfort.

Extirpation of the gall-bladder will be followed by adhesions, but by adhesions much less extensive than adhesions to the gall-bladder. This advantage for cholecystectomy is an advantage, but one of little weight.

Disadvantages.—(*a*) *There is no possibility of draining the biliary passages except through one of the ducts, and that only after a difficult and usually an unsatisfactory operation.*—After removal of the gall-bladder, drainage of the biliary passages is possible only through the open end of the cystic duct left after cutting away the gall-bladder, or through an opening in the hepatic or the common duct. The hepatic duct, in the normal condition, is too small for the use of any but the smallest drainage tubes. Drainage up to the abdominal wound by means of gauze strands is too dangerous and uncertain. Search for the common duct is difficult and often dangerous. Moreover, the insertion of a tube into the common duct undilated is difficult and unsatisfactory. The chance of causing stricture or even obliteration is enough to condemn it. When the ducts are dilated, drainage may be easy. I have seen a cystic and an hepatic duct large enough to admit the forefinger and therefore a satisfactory tube. The common duct I have seen as large as a gall-bladder. Drainage in such cases is, as I say, easy and satisfactory; but the cases themselves are extremely unusual, and they are, moreover, always associated with a permanent impaction of the common duct, with jaundice.

In the difficulties of immediate drainage lies the chief objection to cholecystectomy. In my experience this question is the essence of the whole discussion; for enforced and persistent drainage is one of the chief factors in bringing about the brilliant permanent results seen after cholecystotomy. By drainage the biliary passages

are immediately relieved of all abnormal contents. The biliary discharges undergo in the course of drainage changes in physical appearances that are extraordinary. The beneficial effects of these changes are seen not only in the liver, but in the pancreas. Indeed, I have known a tumor of the pancreas large enough to be felt through the abdominal wall to disappear entirely under a few weeks' drainage through the gall-bladder; while the symptoms caused by this conditions subsided completely and permanently. In three recent instances simple drainage through the gall-bladder was effectual in causing the rapid disappearance of jaundice dependent upon an enlarged pancreas, which enlargement itself quickly subsided.

Drainage is, in most biliary affections, not only an advantage, but an absolute necessity. When, therefore, it is proposed to remove the gall-bladder, it is proposed to dispense with what is in my opinion an essential feature of the majority of cases of biliary surgery.

(*b*) *There is greater danger in the operation.*—This proposition is one of the self-evident truths that would not justify repetition were it not said so frequently that the operation is an easy as well as a safe one. Cholecystectomy may be extremely easy. So may hysterectomy be easy; but, in an easy hysterectomy, wounding of the ureters is also easy. Indeed, the easier and quicker the hysterectomy, the larger the proportion of cut and tied ureters. So in cholecystectomy, facility and rapidity may lead to hemorrhage, to wounds of duodenum or of colon, and even to ligation of common or hepatic duct. Cholecystectomy is not always an easy operation; nor is it always a safe operation. It has possibilities of difficulty and of danger which should be strongly emphasized. Hemorrhage from the denuded liver is in itself at times a very formidable complication, and one that will tax the operator to control. The gall-bladder at its neck is in close relation with structures of the first importance. Even when the anatomy is normal, isolation of the cystic duct may be at times difficult, even in the hands of a skilled anatomist. When the parts above the Foramen of Winslow are buried in inflammatory masses, isolation of the cystic duct may be practically impossible. The operator will be blindly cutting in close proximity to portal vein, inferior cava, or duodenum, the appearances of which will be unrecognizable and the relations indistinguishable. It may even be necessary, in extirpation of the gall-bladder, to resort to Mayo's device of stripping out the mucous membrane—as at times it is necessary to do in similar conditions of the appendix.

(*c*) *Redrainage of the biliary passages is extremely difficult and dangerous.*—The difficulty of draining in the future, after cholecystectomy, seems an important consideration, especially when it is proposed to remove the gall-bladder in all operations for gall-stones.

It is doubtless true that by removing the gall-bladder the chances of gall-stone cholecystitis, or other conditions requiring drainage, are enormously diminished. But nevertheless conditions may arise in which drainage will become necessary. What can be done in the future, if drainage is imperative and there is no gall-bladder? It will become necessary to drain through the common or the hepatic duct, which must themselves be isolated and opened in the depths of a region presumably buried in adhesions of long standing. Such an operation is possible, but it must be regarded as one of the greatest difficulty and danger.

Conclusions.—1. Certain lesions in themselves demand removal of the gall-bladder whenever possible. Such are new growths and gangrenes.

2. Certain other lesions of the gall-bladder are better treated by cholecystectomy. These are the contracted and inflamed gall-bladders, with thickened walls. All gall-bladders which do not permit easy and efficient drainage should be extirpated, for in such gall-bladders the risks of drainage are quite as great as the risks of extirpation; and the one great advantage of retention is impossible—retention of the biliary reservoir to fulfil the functions of that reservoir, and to permit, if necessary, renewed drainage in future years.

3. Drainage is preferable in the dilated and infected gall-bladder, which, however, is neither gangrenous nor to any great extent changed—the slightly thickened gall-bladder containing gall-stones and infected bile. This gall-bladder will, after drainage, become normal, and therefore capable of fulfilling the functions of a gall-bladder. Through it the biliary passages will become effectually drained, after subsidence of the temporary swelling about the cystic duct.

4. As a rule drainage rather than extirpation is demanded in acute cholecystitis with severe constitutionel symptoms, when the gall-bladder is dilated, or at least not contracted, and when it is not gangrenous.

5. In chronic cholecystitis, with dilatation and thickening of the gall-bladder, especially when a stone is impacted in the cystic duct, extirpation is the preferable operation, unless the stone can be dislodged backward into the gall-bladder, in which case drainage is, if not preferable, quite as advantageous as extirpation.

6. In simple gall-stones, without visible evidence of infection or chronic changes incompatible with complete restoration of function, simple drainage of the gall-bladder is indicated.

7. In chronic pancreatitis, whether associated with gall-stones or not, drainage through the gall-bladder is indicated. Cholecystectomy is unjustifiable, for immediate drainage is essential. Furthermore, reopening of the biliary passages may in the future be required.

Bostwick Drug Bill Passed.—The Bostwick bill, amending the Penal Code relative to the sale of drugs and requiring that drugs sold shall be exactly what they are advertised or announced to be, was passed by the Senate last week by a vote of 27 to 3. This bill, if signed by the Governor, will prove, we believe, a very efficient bit of legislation.

SOME PRACTICAL POINTS IN THE ANATOMY OF THE GALL-BLADDER REGION.

BY GEORGE EMERSON BREWER, M.D.,
OF NEW YORK;
JUNIOR ATTENDING SURGEON, ROOSEVELT HOSPITAL, NEW YORK.

IN accepting the invitation of the President of the Academy to present this evening a paper on the surgical anatomy of the gall-bladder and ducts, I did so with a considerable degree of hesitation. This was due to the fact that the subject has already received considerable attention from others, more experienced than myself, from the fact that my own views upon the subject derived from a number of dissections made in 1887, 1888, and 1899 at the anatomical laboratory of Columbia University, have already been presented in a volume of "Contribution to the Science of Medicine" by the pupils of Prof. William H. Welch; and also from the fact that since the publication of that paper I have had practically no opportunity of carrying out further anatomical studies. The present communication will therefore be limited to a few practical points gleaned partly from the work of other investigators and partly from my own. I must crave the indulgence of my audience if in presenting the results of my own investigations, I quote liberally from my previous paper. I feel that I may ask this privilege for the reason that my paper in its completed form was never presented before any medical society.

The important points in the anatomy of this region for the surgeon are: (1) A knowledge of the position of the nerve trunks of the abdominal wall; (2) a knowledge of the normal position, size, shape and relations of the gall bladder and ducts, their blood supply, and the normal position of certain constant lymph nodes; (3) the most frequent variations from the normal in these structures, both congenital and acquired; (4) variations in the arrangement of the blood supply of the liver and gall-bladder; (5) the relations of the duodenal orifice of the common bile duct; (6) the anatomy of the infrahepatic peritoneal basin.

External Landmarks.—In order to preserve the integrity and muscular tone of the abdominal wall after operation, the incision, when made in a region other than the median line, should be so planned as to avoid dividing the lower intercostal nerves, which supply the abdominal muscles. These nerves, as is well known, emerge from the intercostal spaces and pass downward and forward toward the median line, lying between the internal oblique and transversalis muscles, until their terminal branches pierce the sheath of the rectus muscle, which they supply. In order to determine with a fair amount of accuracy the relative positions of these nerve-fibers, the writer made a number of dissections.

The first of these dissections was made by my prosector, Mr. Philip Van Ingen, of the College of Physicians and Surgeons. The subject was specially prepared by being injected with formalin (10 per cent.) to harden the tissues and to render variations in the normal relations of the muscles and nerve-trunks to the bony landmarks improbable.

The results of this dissection were carefully noted, and afterwards verified, on about one dozen other subjects, and although the writer is aware that these observations would be rendered entirely valueless by certain conditions, such as great abdominal distention, obesity, or deformities from spinal disease, yet the results are given for what they are worth.

It was found that the course of the twelfth dorsal nerve would be accurately indicated by a line drawn from a point one cm. below the tip of the twelfth rib to the spine of the pubic on the opposite side; that the position of the eleventh dorsal nerve would be indicated by a similar line drawn from a point one cm. below the tip of the eleventh rib to the middle of Poupart's ligament on the opposite side; that of the tenth dorsal nerve from a point one cm. above the tip of the eleventh rib to the anterior superior spinous process of the opposite ilium; that the course of the ninth nerve would be indicated by a line drawn from a point just below the osteochondral junction of the ninth rib, horizontally toward the median line. That the eighth intercostal nerve would follow a line drawn from a point immediately underneath the costal origin of the eighth cartilage, passing horizontally inward to a point one cm. to the inner side of the chondral border, then upward, parallel with that cartilage, to a point near its junction with the sternum, lying throughout its entire length about one cm. to the median side of its inner margin. Each of these nerves, as it approaches the sheath of the rectus, divides into two branches, one continuing in the course of the line indicating its general direction, while the other passes transversely inward, or inward and upward, and enters the sheath, from one to three cm. above its fellow. It will thus be seen that any incision which exposes the gall-bladder and ducts sufficiently to carry on any operative procedure, must necessarily divide one or more of these nerve-trunks. If, however, we employ the straight incision through the rectus muscle near its outer border, extending from a point one cm. below the free border of the eighth costal cartilage to a point five cm. above the umbilicus, or the curved incision, parallel to the free border of the costal cartilages, extending from a point just below and outside of the ensiform cartilage, and carried downward and outward to a point above the emergence of the tenth nerve, only one—the ninth intercostal nerve—need be divided.

Either of the incisions will give sufficient room for operations on the gall-bladder, but if it is necessary to expose the ducts or duodenum, they will generally be found inadequate; for this purpose the S-shaped incision suggested by Bevan is to be preferred. This consists in an oblique or curved extension toward the median line of the upper extremity of the straight incision and

a curved extension outward of its lower extremity.

Regarding the normal anatomy of the gall-bladder and ducts, it may be stated that the gall-bladder is a pear-shaped, musculomembranous pouch, situated on the under surface of the liver, occupying a position in the fissure between the right and quadrate lobes, the fundus lying anteriorly and projecting for a short distance beyond the free margin of the liver immediately behind the cartilage of the ninth rib, its neck assuming a double curve similar to the letter S, gradually becoming narrower until it merges into the cystic duct. The point of junction with the duct lying near the right extremity of the transverse fissure of the liver, between the two folds of the gastrohepatic omentum.

The interior of the gall-bladder is lined with a reticulated mucous membrane. In its lower portion, near the beginning of the lower arm of the S-shaped curve, Hartmann describes a large semilunar fold, attached for two-thirds of the circumference of the wall, the center of attachment being on the right. Beneath this, arising from the left side or promontory, at the upper arm of the curve, is another but somewhat smaller membranous valve. Between these two valves is a space called by Hartmann *"le bassinet de la vesicule,"* or the pelvis of the gall-bladder. The origin of the cystic duct is just below this second fold.

From one hundred measurements of the gall-bladder made by the writer, nine might be classed as small, measuring 6 cm. or less, while twelve were large, measuring 12 cm. The length of the remaining seventy-nine was between 6 cm. and 12 cm., the average length being 10 cm.

From the inferior extremity of the gall-bladder the cystic duct passes inward for about 3 cm., lying between the folds of the gastrohepatic omentum. Here it joins the common hepatic duct and forms the ductus communis choledochus, the general direction of which is downward and inward, behind and to the inner side of the duodenum, to its junction with the canal of Wirsung in the head of the pancreas, both ducts opening into the ampulla of Vater, situated in the wall of the duodenum, which in turn communicates with the interior of the duodenum by a small opening on the summit of the biliary papilla. The mucous membrane of the cystic duct contains a series of semilunar folds or valves of Heuster, the upper two or three of which are fairly constant. Below this point the arrangement is exceedingly irregular.

Soemmering states that the number of these folds varies between 4 and 20. Henle, Tillaux, Hartmann, Terrier and Dally state that the presence of these valves generally prevents the passage of a sound or probe in either direction.

Puech describes a membranous valve at the junction of the cystic with the hepatic duct.

The mucous membrane lining the other ducts is smooth, no valves being present except at the duodenal orifice of the ampulla of Vater, where the opening is circular and apparently guarded by a sphincter muscle.

In his description of the common duct Quenu divides it into three nearly equal portions, the first lying above the first portion of the duodenum, the second passing beneath the duodenum, the third lying to the inner side of the descending duodenum. The second and third portions, and occasionally the lower part of the first, lie imbedded in the head of the pancreas. The upper third of the common duct lies between the two folds of the gastrohepatic omentum, often at its right free border. The hepatic artery normally lies to the inner side and the portal vein below the duct. From 100 measurements made by the writer the average length of the common duct was found to be 7.5 cm.

The average adult caliber of the common duct, from 10 measurements by the writer, is about 20 mm. in circumference, that of the common hepatic duct 16 mm. The duodenal orifice of the ampulla of Vater would usually allow the passage of a probe 12 mm. in circumference if introduced from above.

Hartmann describes a lymph node to the inner side of the pelvis or S-shaped curve of the neck of the gall-bladder, imbedded in the tissues, in intimate relation with the wall of the duct. If this is enlarged it frequently gives to the palpating finger a sensation of a calculus impacted in the neck. Quenu describes two other constant lymph nodes, one in the angle of junction of the hepatic and cystic ducts and one on the outer side of the common duct just as it passes beneath the duodenum.

Enlargement of the first of these may cause obstruction of the cystic duct, and of the two latter stenosis of the common duct and obstructive jaundice.

The hepatic artery is normally derived from the coeliac axis; near the head of the pancreas it bifurcates, sending one trunk upward to supply the liver and gall-bladder, the other downward to supply the pancreas, duodenum and greater curvature of the stomach. The hepatic branch normally passes upwards to the inner side of the common and hepatic ducts, enters the transverse fissure by two or more branches, from the right of which a small branch is given off to the gall-bladder, passing behind the ducts. The small veins of the gastrohepatic omentum are exceedingly irregular; one or more may cross the common and hepatic ducts.

Variations from the Normal—Quenu states that the gall-bladder is occasionally absent. In these cases there is generally a dilated portion of one or more of the ducts. The commonest seat of such a dilatation is at the ampulla of Vater, beneath the capsule of Glisson or within the substance of the liver. Courvoisier describes a number of such cases; also a number in which he believes the apparent absence of the gall-bladder to be due to extreme inflammatory shrinking, a small fleshy or calcareous nodule being found in the normal position of the viscus. Occasionally

a fully developed gall-bladder may be found imbedded in the liver-tissue. The writer observed such a condition in a patient upon whom he had operated without finding the gall-bladder, and at autopsy it was found within the substance of the liver. Pusser records a case of double gall-bladder, each having a separate cystic duct. Similar cases are reported by Codivilla and Huber. Hochstetter and Carl Beck have recorded cases of left sided gall-bladder, without transposition of the viscera.

Occasionally some of the hepatic ducts open directly into the gall-bladder, and in one case cited by Courvoisier the common hepatic opened into the gall-bladder and the cystic and common ducts passed from the fundus to the duodenum. In this case all the bile passed through the bladder to the intestine.

Membranous partitions have been found in the gall-bladder, generally longitudinal in direction. The organ is occasionally shaped like a horse-shoe.

Congenital absence of the ducts has been reported, but in the majority of cases such absences are associated with absence of the gall-bladder, or are the result of inflammatory processes.

Courvoisier gives examples of the common duct opening into the duodenum without association with the pancreatic duct, also by a double orifice.

Laennec describes the opening of the common duct into the left side of the stomach near the esophagus. Others have recorded cases of the duct opening into the pylorus, fundus of the stomach and colon. In all probability in the majority of these cases the communications were artificial and due to inflammatory and ulcerative changes. Most of these abnormalities are exceedingly rare and should be regarded as anatomical curiosities.

Of the less important but more frequently observed variations from the normal, the writer would quote from his previous paper as follows: Of 100 subjects examined, in no case was there any considerable variation from the normal position of the gall-bladder, excepting that which could be accounted for by its method of peritoneal attachment, or as a result of inflammatory adhesions. In the great majority of instances the gall-bladder received but a partial peritoneal investment, from one-fourth to one-third of its surface being directly in contact with liver tissue. In five subjects, however, it was attached to the liver only by means of a double fold of peritoneum, forming a distinct mesentery, allowing considerable movement. In three of these was also an extension outward of the free border of the lesser omentum to the fundus, and in one instance to a point one inch beyond the fundus, thus forming a double mesentery, the upper being attached to the under surface of the liver, the lower to the duodenum and transverse colon, and in the instance just referred to, to the hepatic flexure of the colon.

These variations in the peritoneal arrangement allowed a considerable amount of mobility of the viscus, which, if rendered palpable by the presence of calculi or malignant disease, might be felt at any point within the radius of its mesentery.

In only one instance of the five did the abnormal peritoneal arrangement present any feature of surgical importance, and that was the case in which the hepatic flexure of the colon presented a gradual curve and not an acute flexion, and occupied a position extending from the posterior abdominal wall, near the outer border of the right kidney, to the junction of the first and second portions of the duodenum, and from this point downwards, entirely concealing the descending portion of the duodenum, and firmly bound down to it. In this instance the gall-bladder lay between the two folds of the gastrohepatic omentum, the free border of which extended well to the right from the anterior margin of the right lobe of the liver to the hepatic flexure of the colon.

In the above five instances the irregularities were presumably congenital, as no evidence of previous inflammation could be detected.

Nine cases, however, were observed where, as a result of a severe inflammatory process, marked changes in the relations of the neighboring viscera had taken place. In seven of these, in which the conditions were practically identical, the gall-bladder was found to be adherent to the first and second portions of the duodenum, the transverse colon, and omentum; rendering access to the ducts and duodenum for purposes of exploration or operation difficult, and only possible after considerable dissection. In two instances the gall-bladder was firmly bound down by adhesions to the duodenum only; in one of these to the first, and in the other to the first and second portions, the former rendering surgical access to the ducts, the latter to the duodenum, difficult.

In only one instance did the writer find any variation in the ducts. In that subject, in addition to the right and left hepatic ducts, which emerged from the liver at the transverse fissure and joined normally to form the common hepatic duct, two other ducts were found, leaving the under surface of the right lobe of the liver at points about one and two inches to the right of the fissure for the gall-bladder, passing inward, between two layers of peritoneum (an extension outward of the lesser omentum), behind the gall-bladder and cystic duct, and joined the common bile-duct at its origin. These auxiliary hepatic ducts were accompanied by large aberrant branches of the hepatic artery.

The cystic duct, owing to the presence of the numerous folds of mucous membrane, rarely permits the passage of a probe, while in the hepatic and common ducts, which possess no such valvular arrangement, probes pass in either direction with the greatest freedom.

To test the frequency and ascertain, if possible, the conditions under which the cystic duct becomes so altered as to freely admit the passage of a probe, an attempt was made in ninety-seven subjects to pass a soft metal probe from the gall-

bladder through the cystic duct into the common duct. In only ten instances was this possible. Of the ten in which the probe passed freely, five, or 50 per cent., presented calculi in the gall-bladder, while of the eighty-seven in which the probe could not be passed, seven, or only 8 per cent., showed calculi.

In the five cases which freely allowed the passage of a probe, but which did not exhibit the presence of calculi in the gall-bladder or ducts, the patency of the duct was in such marked contrast to the great majority of cystic ducts examined, that one was strongly impressed with the possible previous existence of calculous disease in these cases. From these observations the writer feels justified in stating that a degree of patency of the cystic duct, sufficient to allow the easy passage of a probe, is in all probability a pathological condition.

To ascertain with accuracy the position of the hepatic cystic, and common ducts, and their relations to the lower ribs and vertebræ, an adult male subject was injected with 10 per cent. formalin and allowed to remain undisturbed until the tissues were thoroughly hardened and the organs fixed in their normal positions.

An incision was then made exposing the duodenum. This was opened in its second portion, the papilla found and the duct injected from its duodenal orifice with fused metal. The wounds were then carefully sutured. The duodenal extremity of the common duct lies about half an inch to the outer side of the lower margin of the second lumbar vertebra; the cystic duct joins the hepatic opposite the intervertebral disk between the first and second lumbar vertebræ and the right and left hepatic ducts join on a level with the upper margin of the first lumbar vertebra.

The normal relations of the hepatic artery, the portal vein and the bile-ducts have already been mentioned, but in the first 100 dissections by the writer no systematic attempt was made to follow out and ascertain the exact method of distribution of the terminal branches of the hepatic artery, or to note their relations to the ducts.

In general, however, it was observed that there was considerable variation, and that the typical arrangement described in the text-books was not the one commonly present. Ten subjects were, therefore, examined in reference to this point, to ascertain, if possible, the usual method of distribution, and to determine the relations of the chief branches to the ducts.

As in each subject examined, marked differences existed, and as only one corresponded with the text-book type, at the suggestion of Prof. Huntington 40 other subjects were examined, making a series of 50 dissections.

Sketches were made of each at the time of the dissection, which were afterward reproduced in pen and ink.

It will be seen that of the 50 subjects examined, in 3 only did the arterial arrangement correspond with that usually described in the text-books. Eighteen might be said to belong to the so-called normal type, inasmuch as there was a single trunk from the celiac axis, which divided, after giving off the gastroduodenalis, into two or more branches, which passed either in front of or behind the hepatic ducts and eventually entered the liver at the transverse fissure.

In four instances there was a double hepatic artery. In two of these the auxiliary artery came direct from the aorta, in one from the gastric, and in one from the superior mesenteric.

In one instance there were three hepatic arteries, one from the celiac axis, one from the gastric and one from the superior mesenteric.

In nine instances the gall-bladder received branches from sources other than the hepatic artery. In six of these it was from the gastroduodenalis, in two from an auxiliary branch of the superior mesenteric, and in one from an auxiliary hepatic branch from the aorta.

Well-developed branches, capable of giving rise to an annoying hemorrhage, were found arising from the gastroduodenalis and accompanying the common duct for a variable distance in eleven subjects. In two of these subjects, two accompanying branches were present, one on each side of the duct; in two others the branch passed around the duct, while in the remaining seven but a single branch was present, lying to the outer side of the duct. Nine of these vessels were of considerable size, and gave branches to the gall-bladder, the liver, or to both.

In one subject a branch was given off from an auxiliary hepatic artery near the organ of the common duct, and passed downward with the duct behind the duodenum.

In fourteen instances the terminal branches of the hepatic artery passed in front of the hepatic ducts; in twenty-nine they passed behind, while in seven the branches passed both in front and behind.

In ten subjects the hepatic artery bifurcated at a point above the junction of the hepatic and cystic ducts, while in forty it branched below this point, was double or irregular.

In eight instances the type of the arterial arrangement could only be described as irregular. Two of these deserve special mention. In the first the artery divided at the point of departure of the gastroduodenalis into five hepatic branches; two of these passed upward behind the hepatic ducts to the liver; one passed in front of the junction of the hepatic and cystic ducts and accompanied the cystic duct upward to the gall-bladder and right lobe; the two other branches passed outward under the common duct to enter the under surface of the right lobe at points well to the outer side of the gall-bladder, accompanying two auxiliary hepatic ducts from the right lobe. In the other there was no artery supply from the coeliac axis, the hepatic artery arising from the superior mesenteric. In this subject the right branch of the coeliac axis passed downward without branches as the gastroduodenalis.

From these observations upon the arterial supply of the liver, gall-bladder and ducts, it will be

seen that the typical distribution of the hepatic artery, as described in the text-books, is rarely seen in the human subject; that the right or free extremity of the gastrohepatic omentum frequently contains a large number of small arterial branches derived often from sources other than the main branch of the hepatic; that branches often accompany and even wind around the common duct; and that important arterial trunks and branches were found to the outer side of the cystic and common ducts in 34 per cent. of the subjects examined.

With a view to finding some landmark by which the duodenal papilla could be easily found, the writer opened the second portion of the duodenum in 77 subjects and attempted to pass a probe upward into the common duct. Under normal conditions, when the ampulla of Vater is not rendered prominent by the presence of a calculus or other pathological condition, the papilla is not easy to recognize by sight, owing to the large number and size of the valvulæ conniventes in this region, as well as the presence of a considerable amount of fluid intestinal contents, and in not a few instances from ten to thiry minutes' search was required before the papilla was located and the probe introduced.

After examination of a number of subjects in which this difficulty was encountered, it was found that the papilla could be much more readily recognized by the sense of touch when the forefinger was introduced into the intestinal wound and the inner and posterior portions of the duodenal wall were explored.

Quite early in these investigations it was noted that, when the incision into the bowel was made just below the junction of the first and second portions of the duodenum, the edges of the wound separated by the finger and thumb of the operator, and the tissues drawn slightly upward, a marked prominence was noted of the inner and posterior portions of the mucous membrane at the point of juncture of the ascending and descending portions of the gut. This prominence was found to be a fold of mucous membrane made by the rather sharp flexure of intestine at this point. It was crescentic in appearance, owing to the cylindrical shape of the gut, and this crescentic shape was markedly accentuated by the upward traction of the edges of the wound.

It was afterward found that, in searching for the papilla, if the forefinger of the left hand was introduced into the descending portion of the duodenum and directed obliquely inward and backward, the papilla was usually felt when the finger was carried downward to a point where the fold described above rested opposite the middle of the second phalanx; in other words, that the position of the papilla was, as a rule, easily located at a point from 2.5 to 3 cm. from the center of this fold.

To demonstrate that this fold was constant and not an artificial production caused by upward traction of the edges of the intestinal incision, ten dissections were subsequently made upon formalin-injected subjects, in every one of which this fold was found to be present.

Mayo Robson, Rutherford Morrison and others have described a peritoneal pouch capable of holding 400 or 500 c.c. of fluid escaping from a ruptured gall-bladder or duct without overflowing into the general peritoneal cavity. The boundaries of this pouch are, above, the right lobe of the liver; below, the ascending layer of the transverse mesocolon; externally, the parietal peritoneum; internally, the peritoneum covering the spinal column, posteriorly, the ascending mesocolon covering the kidney.

The presence of this pouch is well known to anatomists, but that it is a complete basin capable of holding fluid as described, the writer doubted.

To determine this point, twenty subjects were examined. In three of these, there was found a more or less well-marked right colicophrenic ligament similar to the one constantly present on the left side, which served to make this fossa a basin capable of holding a certain amount of fluid when the subject was placed in the dorsal position. In the remaining seventeen subjects no such barrier existed to prevent the escape of fluid downward along the outer side of the ascending colon into the pelvis and lower abdomen.

THE DIAGNOSIS OF GALL-STONES.*

BY J. B. MURPHY, M.D.,
OF CHICAGO, ILL.

I SHALL confine my remarks to the diagnosis of various conditions induced in the biliary tracts by choleliths and pathogenic flora, either separate or combined, and attempt to associate particular symptomatic cycles with definite pathological lesions based on my experience in 334 cases of gall-bladder and liver disease. To aid me in making the points clear in the brief time allotted for the discussion, I shall make use of the general scheme outlined on Chart No. 1.

It will be unnecessary for me to dwell on the diagnosis of cholelithiasis manifested by the classic and well-recognized symptoms—colic, nausea and vomiting, local sensitiveness and icterus—all of which appear in the order mentioned and disappear within a few days. These cases have been diagnosticated for centuries. The deviations from the usual course are many, the pathologic processes varied and the ultimate result dependent upon diverse conditions. This can best be appreciated by a careful study of Courvoisier's 1,780 collected cases with their varied clinical courses, pathologic manifestations and post-mortem findings. (Published 1890.)

A few words concerning the symptoms themselves may not be out of place before beginning the analysis of the symptom complex of stones in the various positions in the biliary tracts.

The pain may be classed as: (1) the acute in-

*Read before the New York Academy of Medicine, December 18, 1902.

CHART I.

CHOLELITHIASIS DIAGNOSIS.

- **SYMPTOMS**
  - Pain — Local; Referred
  - Colic — Character; Duration
  - Nausea — Emesis
  - Hypersensitiveness — (a) Palpation; (b) Percussion; (c) Inspiration
  - Temperature — Continuous; Intermittent; Remittent; Temperature angle of cholangic infection
  - Tumor — Shape; Position; Continuous with liver; Relation to hepatic margin; Courvoisier's law
  - Jaundice — Continuous; Remittent; Intermittent; Relation to — Pain law; Temperature; Tumor
- **CHOLECYSTITIS AND PERICHOLECYSTITIS**
  - Acute
    - Calculous — Monolithic, 21 per cent.; Multilithic, 79 per cent.; Obstructive; Non-obstructive — Catarrhal; Purulent; Septic; Gangrenous
    - Non-calculous — Post-typhoid, pneumonic; Post-calculous; Crypt infectious
  - Chronic
    - Calculous — Non-obstructive — Catarrhal; Suppurative; Gangrenous
    - Calculous — Obstructive — Large calc. in neck; Infec. above stone; Infec. below stone; Hydrops; Empyema
    - Non-calculous — Catarrhal; Purulent; Contracted; Septic or distended
- **CHOLANGITIS**
  - Cystic duct
    - Calculous (stone in duct) — Acute — Catarrhal impacted stone; Purulent impacted stone; Septic impacted stone; Recurrent
    - Calculous (stone in duct) — Chronic — Impaction; Obstructive; Edema of mucosa
    - Non-calculous — Catarrhal; Purulent; Infective
  - Choledochotic
    - Calculous (stone in common duct) — In transit-traumatic; As ball valve; Stationary (Foreign body); In diverticulum — Without sepsis
    - Calculous (stone in common duct) — Post-colic; (Traumatic ascending infection after passage of calculus) — With sepsis
    - Infective — Catarrhal; Purulent; Septic
  - Terminal, or parenchymatous
    - With septic cholecystitis: 1. Pre-operative; 2. Post-operative
    - Post-colic
    - After calculus
    - After echinococcus cysts, or plugs of mucus
    - Idiopathic — Catarrhal; Purulent; Grave

flammatory or infective type, which occurs in virulent infections and is accompanied by involuntary muscular contraction (protection) of the organ or tissue in which it is situated. (2) The aching, cumulative, tension type, which is not guarded by abdominal tension, but is defended by sudden muscular contraction when pressure is made on the distended viscus. The most characteristic reaction in this type of pain is that elicited by pressure applied beneath the right costal arch when the patient makes an effort at deep inspiration. (3) The referred ache or pain which accompanies either of the preceding types; in this there is neither sensitiveness to percussion or pressure at the point to which the pain is referred. In obstructions to the pelvis of the gall-bladder or cystic duct, the pain is referred, on an average of seven cases out of ten to the right subscapular region, in one, to the left subscapular region, and in the other two, varying from the precordia on the left to the subclavicular region on the right of the sternum and up the neck. In all there is a local pain in the gall-bladder region, extending toward the left to the epigastrium. These figures are based upon repeated soundings and irritations at these points after cholecystostomy.

Colic, as used in connection with this subject, has an entirely different significance from the term pain, as used above. It is pain of a distinctly rapid, intermittent or remittent, spasmodic type. It occurs when a foreign body is being transmitted through a canal, the lumen of which is normally smaller than the diameter of the foreign body. It is never due to the over-distention of the gall-bladder and never due to the retention of bile or mucus under pressure. If the foreign body becomes stationary in the duct beyond a few hours, the colic ceases so long as the stone does not advance. It is, therefore, due to a foreign body *in transit* through the ducts. The contraction in the duct wall has been demonstrated to take place one-half to one centimeter from the foreign body, on the hepatic side of the foreign body, when it is in the common duct. The colic is supposed to be due to this muscular contraction. We know the colic in intestinal lesions is due to muscular spasms. The colic is not due to *inflammation* of the gall-bladder, notwithstanding Kehr and Herrick's support of that theory. It is absent under two conditions: (1) when the foreign body is too large to be grasped by the canal, as in the case of stones over one-half inch in diameter; and (2), when they are too small to produce a spasm of the duct in their passage, as the granules frequently found in the sifted stools of cholelithic patients. The large calculi found in the common and cystic ducts are advanced to these positions through cumulative pressure behind, rather than by spasm of the muscular fibers. There has not been demonstrated, to my knowledge, a peristaltic wave in the biliary ducts.

Colic does not occur in obstructions of the ducts from catarrhal or infective edema of its mucosa, nor from obstruction by pressure of neoplasms in the walls or neighborhood of the ducts, nor from cicatricial occlusions nor obstructive flexions of the ducts. Colic is, therefore, absent in every type of biliary obstruction except that of foreign bodies—calculi, echinococcus, ascarides, clumps of mucus, polypi, etc.

The duration of the colic depends upon the length of time the foreign body is moving through the canals. It may cease to advance in the canal, as in the pelvis of the gall-bladder, in the ampulla of Vater or in the dilated condition of ball-valve formation and diverticulum development, and remain there for months or years without producing colic; but as soon as it moves forward in the ducts, there is a recurrence of the spasm. The same is true after cholecystotomy, when the stone moves backward in the cystic duct into the gall-bladder.

The nausea and emesis of biliary obstruction are reflex symptoms, the same as the nausea and vomiting of the obstructed appendix or the obstructed ureter. They may be short in duration or they may continue during the entire period of acute obstruction. By their relaxing effect, they favor the dropping back of the stone into the gall-bladder, in obstructions of its pelvis and often terminate the attack—the so-called "vomiting of gastralgia." The vomiting may last from a few minutes to several hours or days, resembling that of mechanical intestinal obstruction.

There is a second variety of reflex vomiting due to torsion, flexion or valve obstruction of the cystic duct; in this class, the vomiting continues for days, with no severe pain and no colic, and is relieved by liberation of the obstruction and the escape of the gall-bladder contents. When the abdomen is opened for this condition, the gall-bladder is usually enlarged and *not compressible.* It is filled with mucus and grumous bile, but there is no pus. This is a typical reflex phenomenon and of the recurrent type. The vomiting resembles that of pyloric obstruction of acute character and may be so severe as to border on dissolution. I recently operated on a case of this character for Dr. Alex. C. Wiener; the patient made a rapid recovery. The gastric crises of tabes, with or without pain, are often mistaken for gall-stone attacks, but can easily be differentiated. The cure is usually permanent by the fixation of the gall-bladder, favoring a permanent and efficient drainage (Mayo).

Hypersensitiveness of the gall-bladder is present in all varieties of *infection* and *calculous* obstruction, but not in the neoplastic, torsion, flexion, cicatricial or valvular obstructions. The hypersensitiveness is elicited by deep palpation just below the right ninth costal cartilage, or in a line from that point to the middle of Poupart's ligament, as this is the common track of gall-bladder enlargement. Deep percussion along the same line, with patient in forced inspiration gives pronounced pain. The most characteristic and constant sign of gall-bladder hypersensitiveness is the inability of the patient to take a full, deep inspiration, when the physician's fingers are hooked up deep beneath the right costal arch be-

low the hepatic margin. The diaphragm forces the liver down until the sensitive gall-bladder reaches the examining fingers, when the inspiration suddenly ceases as though it had been shut off. I have never found this sign absent in a calculous or infectious case of gall-bladder, or duct disease.

Temperature in biliary infection is very characteristic, almost to a pathognomonic degree; and still more, it has variations peculiar to infections in various positions—in the gall-bladder or the ducts. I shall not go into the details of these variations here, as they will be considered under the different types of infection. I wish only to emphasize the peculiar *angularity* of the temperature and the duration of the complete intermissions, in both of which characteristics it varies from the *curves* with remissions found in other types of infection.

In upward of 80.25 per cent. of cases of cholelithiasis with jaundice, Courvoisier found the gall-bladder contracted. Therefore, in four-fifths of all the cases of cholelithiasis, we should expect an absence of tumor formation. The greater portion of the 20 per cent. in which there was an enlargement of the gall-bladder it was due to impaction of large calculi in the neck of the gall-bladder or in the cystic duct without severe infection, with an occasional impaction in the common duct, under the same circumstances. Where the obstruction was due to other causes, and particularly when associated with jaundice, the same author found an enlargement or tumor of the gall-bladder in upwards of 90 per cent. of the cases. The contraction or diminution in size of the gall-bladder in cholelithiasis is due to infection, infiltration and subsequent contraction. This led to Courvoisier's law, which is—"In 80 per cent. of the cases of obstruction of the common duct due to stones, there is contraction of the gall-bladder, while in 90 per cent. of the cases of enlargement of the gall-bladder, the obstruction is due to causes other than stone," such as cancer and cysts of the pancreas, pressure from other neoplasms, cicatrices, lymphatic glands (Bremer), pressure on the ducts, torsion, flexion, etc. The characteristics of cholecystic enlargements are: (1) That they are continuous with the upper surface of the liver; (2) that they project sharply from the margin of the liver; (3) that the margin of the liver can occasionally be traced to a gradually diminishing edge attached to the upper surface of a globular mass. (This last is characteristic of gall-bladder enlargement.) The enlargement is often associated with the linguiform elongation of the right lobe.

Therefore, a large gall-bladder with jaundice is indicative of malignant disease or cicatricial contraction and contracted gall-bladder indicates a cholelith, in the percentage already mentioned. The contraction of the gall-bladder in gall-stones is due to the infection of the gall-bladder with infiltration of its walls and subsequent contraction, the same as we frequently see in the urinary bladder under like pathologic conditions. Although Ehret and Stolz discredit Courvoisier's law and do not seem to accept this explanation, they both correspond with our experience. It is equally clear why the gall-bladder should enlarge with non-infective obstructions of the common duct or cancer of the pancreas, exactly as the urinary bladder enlarges from aseptic compression in prostatic hypertrophy, by producing distention and backing up of the fluid.

In the cases operated on by me, jaundice, as a symptom, has been absent in 86 per cent. of the cases, both in the history and in the patient at the time of admission to the hospital. That is, in only 14 per cent. of the patients operated was jaundice manifest as a symptom at any time in the course of the disease. Adelbert Merk found jaundice in 58 per cent. of his first 104 cases. The degree of the jaundice depends upon the completeness of the obstruction and not on the size of the calculus. The degree of obstruction is greatly influenced by the infection of the duct at the seat of the calculus; that is, the obstruction is made up of the mechanical and infectious elements. The inflammatory element can be appreciated by recalling the intense jaundice which may be present in catarrhal inflammatory processes of the common duct. The jaundice is continuous throughout the entire course of the disease without even a remission, in malignant obstructions. It is remittent in calcular obstructions, with changes in the degree of the infection, with dilatation of the duct to the condition of ball-valve formation, and when the stone remains for a long time in one situation. While it may be *remittent*, it is never *intermittent* while the stone remains in the hepatic or common ducts. It *is* intermittent when the stone is partly in the common and partly in the cystic duct; it is intermittent when the stone is situated in the cystic duct or gall-bladder and causes recurring inflammatory swellings which extend to the common duct; and it is intermittent between the passage of stones through the common duct.

In the relation of jaundice to pain, this law may be formulated: (1) That jaundice due to gall-stones is always preceded by colic; (2) that jaundice due to malignant disease, or catarrh of the ducts accompanied by infection, is never preceded by colic.

To simplify the subject of diagnosis, we shall make an excursion with a calculus from its place of formation in the gall-bladder, through its neck, through the cystic and common ducts, and on through the enteric tract. The difficulties which we shall encounter in transit will be dependent upon: (*a*) the size of the calculus; (*b*) its impaction in the neck of the gall-bladder or the ducts; (*c*) its course and speed of transit; (*d*) its arrest within the ducts or diverticula; (*e*) its escape through the wall of the biliary tract, (1) into the peritoneal cavity, (2) into neighboring viscera, or (3) through the abdominal wall; (*f*) added to these are the deleterious effects of a more or less virulent infection induced by a variety of infective flora. From the culture experi-

ments, it is impressed upon us that the bile in cholelithiasis should be considered, from a surgical standpoint, always infected and treated accordingly. This statement does not include all cases of cholelithiasis, but only those applying to the surgeon for relief. The tracts of infection are: (*a*) the portal vein to the liver; (*b*) the common duct, from the intestine; (*c*) the splenic vein; (*d*) the general circulation (this is rare—Remy); and while infective microorganisms are often present in the bile tracts, it requires other conditions to make the bile and the canals good receptive media; the presence of infective flora is not incompatible with the normal function of the canals.

Calculi may be present for an indefinite period without producing any recognizable symptoms. The records of necropsies show that gall-stones are present in from 6.94 per cent. (Johns Hopkins Hospital Reports) to 12.2 per cent. (von Recklinghausen) of all post mortems. A very large proportion of these cases presented no symptoms during life, and doubtless in a smaller number, the symptoms were present but unrecognized. It is therefore evident that there are special conditions necessary for the development of a symptomatology in connection with gall-stones in the gall-bladder. These are principally: (*a*) disarrangement of the calculi; (*b*) impaction in the neck of the gall-bladder and (*c*) infection of the gall-bladder, with or without impaction. When gall-stones become disarranged, they are frequently carried with the bile and mucus into the neck of the gall-bladder and if small, on through the ducts into the intestine, producing pain, nausea, hypersensitiveness and jaundice; then the attack subsides, to recur at varying intervals. When a large calculus produces disturbance by impaction in the cervix of the gall-bladder, the symptoms are pain, nausea and vomiting, pronounced hypersensitiveness, particularly when, in the examination, the fingers are hooked up under the liver and the patient attempts to take a deep inspiration; then the pain becomes intolerable. This is the most constant and characteristic symptom; percussion below the ninth costal cartilage on the right side may give pain; there is no jaundice and no elevation of temperature; the attack usually subsides with the emesis, the pain being relieved by the stone falling back into the now globular, overdistended gall-bladder, the relaxation occasioned by the vomiting favoring this change of position. So closely is the relief associated with the emesis that patients frequently say, "If I could only vomit, I should be relieved of my gastralgia;" and "gastralgia" is the diagnosis made by the physician in more than 90 per cent. of the cases. This is the most common type of cholelithic manifestation, and a single patient may suffer from two or three to as many as a hundred attacks, before the stone becomes permanently impacted in the cystic duct, or a new train of symptoms develops from an intercurrent infection. I have watched one patient go through these attacks almost monthly for three years, and another for seven years before they would consent to operation.

When infection of the gall-bladder takes place, with calculus, the disturbance produced is in direct proportion to its virulence and tension; if mild, it produces a hypersensitiveness and no pyrexia unless the products of infection are retained in the gall-bladder under pressure by the impaction of a stone in its cervix; then the temperature rarely exceeds 101° F. This is a common course in the aged; the pain is pressing, continuous in character, not colicky; a small tumor may be palpable in the right hypochondrium; there is no jaundice and the attack is passed through in six to ten days. When the infection is virulent, the pain is more severe; within a few hours of its onset there is a chill; the temperature usually rises to 102½°, or 103½° F.; the right hypochondrium becomes exceedingly tender; the rigidity of the muscles prevents the palpation of a tumor; nausea and vomiting are frequently present and persistent, and the patient's condition is one of profound depression with infection.

The mucosa of the gall-bladder may become necrotic and even rupture to form a circumscribed or general peritonitis. I recall a case of this kind which occurred the second day after confinement. The rupture took place into the peritoneum and the patient died on the sixth day of a general suppurative peritonitis. The cardiac manifestations and anxiety of the patient were such that the suspicion of angina pectoris was entertained until a few hours before death. The symptomatic manifestations of infectious cholecystitis without impaction of the stone in the neck of the gall-bladder or cystic duct are neither so severe nor dangerous, as when the impaction occurs after a virulent infection. Here the pain is more intense, the chill is usually severe and prolonged and the temperature rapidly reaches 104° to 105° F. The vomiting is persistent and the depression great. Pressure in the right hypochondrium cannot be tolerated and the patient is intensely ill. So destructive is infection under these circumstances, that the mucosa of the gall-bladder rapidly becomes gangrenous from the biotic and toxic effect of the micro-organisms and the pressure under which the products of infection are retained. Three of my most pronounced cases of this type were of monolithic origin, the first operated by me for Dr. Conley under the diagnosis of acute appendicitis:

Case I.—Mrs. C., aged sixty-two years, weight 260 pounds; liver was enlarged and the gall-bladder situated in the right iliac fossa, was adherent to the caput coli and small intestine. Its mucosa was gangrenous and the gall-bladder was full of pus, notwithstanding that the operation was done 42 hours after the initial symptoms. A single pure cholesterin calculus was impacted in the cervix of the gall-bladder; it was easily removed, immediately followed by the discharge of bile and the patient made an uninterrupted recovery.

Case II.—Operated for Dr. Brumback. Mrs. M., age fifty-four years; diagnosis, infective

cholecystitis; obstruction of cystic duct; operation 62 hours after onset. The entire gall-bladder was gangrenous and came away as a slough the sixth day after the operation, and with it a single, clear cholesterin stone. Recovery.

Case III.—Miss F., age twenty-six years; Mercy Hospital; operated 41 hours after onset. Gall-bladder gangrenous; portions of it sloughed, and came away a few days after the operation. Single mixed calculus. Recovery.

In these three cases, there had been no previously recognized symptoms of gall-stones.

Case IV.—Rev. F., aged fifty-eight years; Mercy Hospital. History of gastralgia for a period of twelve years. The attacks were never accompanied by fever, nor followed by jaundice. The present attack was initiated by pain, severe chill, high temperature and the classic symptoms of virulent gall-bladder infection. Operation 64 hours after onset of symptoms. Mucosa gangrenous in many areas. A large number of calculi were found, one impacted in the cystic duct, and there was a considerable quantity of offensive pus. Recovery.

An accurate diagnosis was easily made in the last three cases after the error which occurred in the first. These cases illustrate how rapidly destructive, virulent infections of the gall-bladder become under the pressure of accumulating products, with impaction in the neck of the cystic duct.

There is another distinct type of infection of the gall-bladder. It is manifest by recurring chills, high temperature, with a complete subsidence of the temperature within a few hours. There is absence of pain, no colic, no jaundice, but occasionally a mild discoloration of the sclera; in short, there are no symptoms specially referable to the biliary tracts. These are acute cases, and in all of mine they have been associated with enlargement and edema of the gall-bladder wall. Some had previously complained of an aching sensation in the right hypochondrium, with no pain and no other noticeable symptoms. These cases are most difficult of diagnosis and still the few symptoms are sufficiently regular and characteristic to admit of a diagnosis before operating. The attacks come on with severe chill, without pain; the temperature in an hour will rise to 104° to 105° F., remain stationary for a few hours, and then drop as suddenly to normal and remain normal for hours, days or even weeks, when it will as suddenly go through the same rapid variation and continue to repeat itself at irregular intervals; all of the time without any special reference in a symptomatic way to the gall-bladder. So pronounced is the chill and so complete the fever intermission that the most common diagnosis is malaria. These temperature changes are so characteristic that I have given them the name of "The Temperature Angle of Cholangic Infection." The one physical manifestation which was uniformly present was the inability of the patient to take a deep inspiration without pain, when the physician's fingers were deeply pressed beneath the right ninth costal cartilage. These attacks occur with or without stone; more frequently without. I shall cite an illustrative case: Dr. B., aged thirty-nine years, was ill for a few days and while en route from Chicago to New York, for his summer vacation, was attacked with a severe chill; temperature rapidly reached 104½° F.; subsided within a few hours to normal, leaving him a little the worse for his experience; the third day following, he had a similar attack; on the fifth another; and on the seventh, a fourth; he had no pain and no sensitiveness or soreness in any part of the body. The malaise and depression, following the high temperature became marked, so he returned to his home in Chicago. Blood examination revealed absence of plasmodia; a hyperleucocytosis of 9,200; absence of Widal reaction. Chills and fever now became more frequent, occurring sometimes twice in one day and then skipping a day or two. The temperature, following each chill, was never less than 104° F. and reached as high as 106° F. He became emaciated, sallow, extremely feeble and death seemed imminent. There was no jaundice and no symptoms referable to the biliary tract. A careful examination elicited sensitiveness in the right hypochondrium beneath the costal arch on deep respiration. Diagnosis: infection of the neck of the gall-bladder and cystic duct, without calculus. Operation, cholecystotomy, seven weeks after onset of symptoms. The mucosa of the gall-bladder resembled a granulated eyelid; no pus discernible macroscopically; culture and microscopic examination showed the presence of the *Staphylococcus albus*. The second morning following the operation, there was a recurrence of the chill with temperature of 105° F.; from that day the temperature gradually become less, and in ten days reached normal and patient made rapid and complete recovery. The drainage tube was not removed for a number of months, because in a previous case of this character, the patient died on the third day after the removal of the drain and closure of the gall-bladder by suture, notwithstanding it had been draining for three months and all of the evidence of infection had ceased; cause of death, acute, septic cholangitis, though the sutures were removed on the second day. I could cite a number of septic cases similar to the above, all without pain, distress or perceptible tumor, but one is sufficient to illustrate the class; in these cases the gall-bladder was not contracted.

Another type of gall-bladder infection may possibly be confounded with this, that is, acute phlegmon of the gall-bladder, developing on malignant disease of its mucosa. The onset is severe, with chill and high temperature, with or without colic. There is a remission of the temperature morning and evening from this time as in ordinary septic processes, but never complete intermission, therein differing from the temperature angle of gall-bladder infection. After a septic process is inoculated upon a malignant lesion of the gall-bladder, the downward course of the patient is rapid and uninterrupted, the sepsis play-

ing an important rôle. These patients usually succumb in from three to six weeks. In syphilis of the liver, the temperature is of a remittent type, and often continues for weeks at a time. It is only occasionally associated with jaundice. It rapidly disappears on mixed treatment. In my early experience, I made a section on one of those cases, believing it was calculous disease with infection. The patient rapidly recovered under mixed treatment.

We have another class of cases, the contracted type of gall-bladder with infection, with or without preceding colic, but usually the sequence of primary calculous disease. In this class, the patient has recurrent attacks of chills and high temperature with subsidence, remaining normal from a period varying from a few hours, to as many months, when the same symptomcycle is again passed through. Here we have also the classic temperature angle of cholangic infections. The gall-bladder is contracted to a teat-like process, indurated, deformed and surrounded by adhesions. A case: Mr. C., aged seventy-eight years; seen in consultation with Dr. Norman Bridge, of Pasadena, in March, 1900. The patient gave a history of recurring attacks of chills and fever running over a number of years. The attack would come on every few months, last a few weeks and disappear, to recur, sometimes with regularity, again without. The attacks were never associated with pain or marked sensitiveness and the patient was never jaundiced. When seen in consultation, he had had two chills within twenty-four hours; following each the temperature exceeded 104° F., and the patient was in a very much impaired condition and had been confined to bed. It was agreed that the cause of the manifestations was a cholecystic infection, although the only physical sign present was tenderness beneath the right costal arch on deep inspiration, but there was the classic temperature angle of cholangic infection. The operation revealed a gall-bladder not larger than the little finger to the second joint, buried in a mass of adhesions; when opened, its wall was one-quarter of an inch thick, and its lumen contained only a few drops of mucopurulent material. It was incised for its entire length into an occluded cystic duct; a rubber tube was sutured into the incision, as the lumen was so small it would not admit it. Following the operation, the patient had a few chills and high temperature. His temperature the fourth morning was slightly elevated and from that time his convalescence was slow but complete and there has been no return of the symptoms, up to August of last year, when I received my last report of the case from Dr. H. H. Sherk, who assisted me in the operation, and cared for him afterward. A similar condition, with a history extending over a period of four years and associated with occasional attacks of colic, a mild icterus and an hour-glass contraction of the gall-bladder was found in the case of General A., operated by me a year ago this month, for Dr. Jennings, at Detroit. It was evident, from the history, that there had been a stone at some time previous to the operation, although none was found at the operation. The attack of gall-bladder trouble could be distinctly traced to a typhoid which occurred four years previous. His recovery has been complete. Drs. Jennings and Longyear reported colon bacilli from the cultures of the gall-bladder four months after the operation.

Cystic duct obstructions present a different train of symptoms from those of the gall-bladder, dependent principally upon the size of the calculus. If that be sufficiently small to become engaged in the cystic duct for a short time, the patient suffers colic, nausea and vomiting, local tenderness without temperature and the attack terminates in jaundice, with sudden cessation of the colic, or with a gradual cessation of the colic and a retention of the stone impacted in the cystic duct. If the stone be large, it may remain in this duct for years and will be followed, as a rule, by enlargement of the gall-bladder and hydrops or empyema, depending upon the type and degree of the infection. If the stone gradually advances in the cystic duct, even when it is a large one, it may do so without colic, but with a constant sense of pressure, pain and hypersensitiveness. A stone five-eighths of an inch in diameter to twice that size will gradually advance in the cystic duct until it reaches the common duct and the patient will never complain of colic or suffer from chills and fever. Infection in this class of cases has been shown by examination to exist below the calculus, but rarely does it extend to the gall-bladder, and once the stone is impacted, it is practically impossible for infection to pass by it into the gall-bladder. If virulent infection surrounds the stone, there will be necrosis and perforation of the duct and usually perforation of the neighboring viscus which becomes adherent to the duct, and the calculus escapes into the alimentary tract. An unusually large stone may be retained in a diverticulum or pouch of the cystic duct; in that position it frequently becomes infected and manifests itself by chills and angular temperature. There are no sweats and no colic or jaundice. These symptoms may be repeated for days and then subside for weeks, the same as in gall-bladder infection. The manifestations of septic absorption are far more marked than in the gall-bladder. These cycles are not accompanied by pain or colic and never by icterus, but always by hypersensitiveness in the right hypochondrium. When a stone becomes retained in a diverticulum, the virulence of the infection may subside and the patient recover without operation, by the escape of the calculus or even with the calculus retained in position, but then the infection usually recurs. If the quantity of pus discharged from the cystic duct into the common duct from an infected retained calculus be as great as that discharged into the gall-bladder after a cholecystotomy, it is surprising that we do not have more frequent symptoms of common duct infections. This is rare, though mentioned by Ehret and Stolz. It is possible

edema occludes the duct on the proximal side, but it does not do so often. Swelling of the mucosa often occludes the cystic duct for days after cholecystotomy, wherein all the stones are removed and during that period of occlusion no bile escapes through the external opening, and no biliary drainage is in progress.

Stones in the Common Duct.—If a stone passes rapidly through the common duct and is retained for only a few hours or a few days, the patient suffers from the classic attack of colic and pain in the right hypochondrium and referred to the epigastrium, the right subscapular region and occasionally to the left subscapular region; nausea and vomiting, jaundice and epigastric tenderness, without fever. The colic continues as long as the stone continues to advance in the duct. If the stone becomes stationary or forms a dilatation of the duct, there is a cessation of this symptom. The amount of icterus will depend upon the degree and duration of occlusion of the duct. When the stone is arrested in the canal the icterus continues, though it may be remittent. It is never truly intermittent as long as the stone remains in the duct. It is difficult to appreciate how a stone can so occlude the duct as to produce acholic stools for a long period of time, when we think how difficult it is to plug an external biliary fistula so that it will not leak. It should be equally difficult to completely occlude the common duct. The occlusion must be due to the infection and swelling of the mucosa about the stone. Occasionally the stone is arrested in the duct, and remains stationary for a longer time. There is then a dilatation of the duct on the hepatic side of the obstruction, which may become so great that the stone is permitted to slide back and forth in the dilated portion of the duct, giving rise to the valve-like action of Fenger. When the stone is in this position, there may be a diminution of the icterus, but it is never completely interrupted. The presence of biliary coloring matter in the blood with icterus absent, for months after the calculus is removed, cannot be interpreted to mean that the duct is still obstructed or the smaller channels are infected. The patient ceases having the attacks of colic when the stone is not advancing, though pain may be recurrent. In this upper portion of the duct, as well as in the ampulla of Vater, the canal very frequently becomes infected. Even in the physiological condition, it is quite common to find infective flora from the duodenum in the apparently normal duct, as high as the bifurcation. When the foreign body causes an abrasion, there is then formed an atrium for infection and absorption, and the patient begins to have the manifestations of infective jaundice, formerly called "pernicious malarial jaundice" or "malignant jaundice of ague." When this infection occurs, we have repeated chills, high fever and rapid subsidence, with complete intermission of the fever and chills, a continuation of the jaundice, with a recurrence of the cycle of symptoms. The temperature angle is the same as mentioned in the infections of the canal higher up, and is equally characteristic. Here it is associated with jaundice, showing the location of the stone. It is not surprising that we have an infection when the stone is arrested in the duct, nor is it to be wondered at that we have pronounced manifestations, both in the quantity of pus produced and the symptoms of sepsis. The neck of the gall-bladder, the cystic duct and the common duct have a rich supply of lymphatics, and so respond to infection with the same pronounced manifestations as the cervices of the other hollow viscera, such as the urinary bladder and the uterus when acutely infected. Once sepsis is manifested with a stone in the common duct, there appears to be no cessation of recurrence of symptoms of the septic process, until the foreign body is removed. This is exactly what occurs when a foreign body becomes impacted in the nose; we note the fever, the edema, the purulent discharge and eczema, produced by a peanut or grain of corn in a child's nose. When a stone has once formed a diverticulum or dilatation of a duct, it is seen that it is next to impossible for further progress in the canal to take place, and the smaller the duct the greater the liability of the retention. It can, however, escape through ulceration of the wall of the duct, into the peritoneal cavity or into a neighboring adherent viscus, as the stomach or, more frequently the duodenum. When the sepsis is pronounced, with the stone in the common duct it terminates in a comparatively short time; either the stone perforates the canal, and permits the free passage of the bile, or the patient dies of septic cholemia.

When the stone is arrested in the ampulla of Vater, the drainage is frequently more free and the manifestations of sepsis less marked, than when it is one-half inch or more from that point in the common duct. When in the ampulla of Vater, we have the additional danger of infective pancreatitis or fat necrosis. When in the course of a calculous jaundice we have a sudden and extreme collapse, intense pain without any gradual preceding increase of pain, it is right to assume that the condition is due to a beginning fat necrosis, and not to a perforative peritonitis, nor to a progressive infective cholangitis. In the fat necrosis there is no hyperleucocytosis; with perforative peritonitis, and the acute infective cholangitis there is a pronounced hyperleucocytosis. If an operation be performed the plaques of fat necrosis in the mesentery and omentum and the nodules in the pancreas will indicate the pathological condition, though the stone will be found in the common duct and a septic peritonitis not manifest. In these cases the surgeon should not stop with the recognition of the fat necrosis, but continue to the removal of the calculus. For some unexplained reason, the operation appears to have a beneficial effect upon the fat necrosis, even without incision of the pancreas.

The escape of the stone from the gall-bladder into the stomach, is not an uncommon complica-

tion. In one of my cases, the patient vomited gall-stones for a number of months after I had opened and drained the gall-bladder, and removed all the stones in sight. In another I found the stone protruding into the stomach and also into the gall-bladder, from an intermediate gastrocystic pocket or sinus. When large gall-stones are found in the common duct, there may be complete absence of a preceding symptom of colic, under the same conditions as we find stones in the cystic duct, and foreign bodies in the intestine without colic, namely, in a dilated portion, stationary and not completely occluding the lumen. These, however, are the rare exceptions, and it may be laid down as a law (*a*) that icterus unaccompanied or preceded by colic is not of calculous origin; and (*b*), that a gall-stone jaundice is always preceded by colic; if the jaundice be of long duration, the patient may forget the primary attack of colic.

As a striking exception to this rule, I shall cite a case: Dr. H., Vancouver; aged fifty-eight years; Mercy Hospital. Patient had suffered from jaundice for nine months previous to admission; being a physician, he gave an exact account of the onset. It came on gradually, and never subsided nor diminished materially in its intensity. There was no pain on the days preceding the attack, and no history of pain or colic in the right hypochondrium. He had lost 23 pounds in weight. The icterus was intense; no tumor detected; some sensitiveness on deep inspiration in the right hypochondrium. From his history, a diagnosis of probable carcinoma of the head of the pancreas was made; there was no sugar in the urine. The doctor desired an exploratory operation, the usual trans-rectus incision was made. The gall-bladder was enlarged, not materially thickened and practically normal in color. There were no adhesions and in the common duct was found a calculus five-eighths of an inch in diameter and one and one-eighth in length. It was removed and the duct sutured; the pancreas was not involved. Patient's recovery complete. This case illustrates the type of large stone in the common duct with jaundice not preceded by pain or colic. In the cystic duct large calculi are the more common, and here they are forced into the duct by the contraction of the gall-bladder, or better, by the accumulating mucus in the gall-bladder. So gradual is the advancement of these large calculi that colic should not be expected, for physical reasons. The large calculi of the common duct show by their formation that they receive accretions while they are in the duct, recorded by their various biliary-colored layers. From the history and symptoms, with the exception of duration of existence, there is practically no means of making a differential diagnosis between this and malignant disease.

There are two very strikingly contrasting conditions under which passing gall-stones do not produce colic; one when they are very small. too small to produce obstruction or spasm of the ducts, and the other when they are very large, so large that the wall is paralyzed by the overdistention and infiltration by the extremely slow advance of the stone.

When gall-stones produce obstructions in the intestinal tract, they usually find entrance into that canal by perforations of the wall of the gall-bladder or ducts. This is rarely preceded by icterus, as stones of great size seldom find admission into the intestine through the common duct. There are no special symptoms by which the obstruction of biliary enteroliths can be differentiated from the obstruction of coproliths. It is unnecessary to give these cases in detail.

THE MORTALITY IN APPENDICITIS; ITS CAUSE AND LIMITATION.

BY A. J. OCHSNER, B.S., F.R.M.S., M.D.,
OF CHICAGO, ILL.

SURGEON-IN-CHIEF OF THE AUGUSTANA HOSPITAL AND ST. MARY'S HOSPITAL OF CHICAGO; PROFESSOR OF CLINICAL SURGERY IN THE MEDICAL DEPARTMENT OF THE UNIVERSITY OF ILLINOIS.

IN selecting this subject I have complied with a request of the officers of your association, well knowing that it is old and almost worn out, because almost every surgical writer of the past decade has discussed appendicitis.

It has been the hope of most surgeons of the present generation to be able to aid in some way in reducing the mortality in acute appendicitis and, although the subject has been approached from many different sides and the views of the various authors have diverged greatly and have been even diametrically opposite in many details, still I believe that the time is not far distant when these combined efforts will result in a great reduction of the mortality in this disease.

From the character of the disease itself it is plain that there must always be a mortality. It will never be possible to formulate methods of treatment which will be successful in every case.

Experience has taught some most important facts in connection with this disease, which it seems to me, should act as the foundation upon which to build the methods which are to reduce its mortality. We know from experience that there are two classes of patients suffering from appendicitis in whom the mortality is almost ideally low. The first class contains the patients who come under the care of the surgeon at the very beginning of the attack, before the infectious material has extended beyond the tissues of the appendix. This condition is usually present in severe cases during the first thirty-six hours after the beginning of the attack and in milder cases for a longer period. The second class comprises the patients who come under the care of the surgeon during the interval between acute attacks. If it were possible then to reduce all cases of appendicitis to these two classes, the mortality for all cases would of itself become exceedingly low.

In order to illustrate the manner in which a form of treatment can be built up on these two important facts in practice I have reviewed the

histories of all the patients whom I have operated during the present year at the Augustana Hospital from January 1 to December 1, 1902. I have chosen this period arbitrarily, because in this manner we can obtain a fair average without covering too great an amount of material and the cases all being operated and treated in the same hospital by the same surgeon with the same assistants necessarily insures a fair degree of uniformity. I will state, however, that my results have been the same in the cases I have operated during the same period of time in St. Mary's Hospital.

The entire number of patients I have operated during this period in the Augustana Hospital is 337. Of these 192 were acute and 145 chronic. Of the former class 81 suffered from perforative or gangrenous appendicitis with more or less extensive peritonitis, 13 of these suffered from diffuse peritonitis at the time of admission; 111 cases suffered from acute appendicitis without perforation, the pus being confined to the lumen or the tissues of the appendix.

The general plan of treatment adopted was as follows: In every case of acute appendicitis entering the hospital all food by mouth and all cathartics were prohibited. In case the patient suffered from nausea or vomiting, gastric lavage was at once employed. In the milder cases the patient was permitted to rinse the mouth with cold water and to drink small sips of very hot water at short intervals. In the severer cases the patient was permitted to rinse the mouth with cold water, but was not permitted to drink either hot or cold water for the first few days until the acute attack had subsided when the use of small sips of hot water was begun. If the nausea persisted gastric lavage was repeated once or twice at intervals of two to four hours, in order to remove any substance which had regurgitated into the stomach from the small intestines.

The patient was supported by nutrient enemata consisting of an ounce of one of the concentrated predigested liquid foods in the market, dissolved in three ounces of warm normal salt solution introduced through a catheter which was inserted a distance of two and one-half to three inches. In case this gave rise to pain or irritation or nausea it was interrupted for twelve to twenty-four hours at a time. In cases in which no water was given by mouth an enema of eight ounces of normal salt solution was given four to six times a day in addition to the nutrient enemata. In cases operated during the acute attack this treatment was continued for several days after the operation.

After the patient had been free from pain and otherwise practically normal for four days he was first given from one to four ounces of weak beef tea, preferably prepared from commercial beef extract every two hours. In a few days one of the commercial predigested foods, dissolved in water was substituted, still later, equal parts of milk and lime water, then general liquids, then light diet and finally after the patient had fully recovered, full diet was given. The commercial extract of beef was chosen, because it contains only soluble material which will usually be absorbed from the stomach without giving rise to peristalsis. The rectal feeding was continued in the mean time. By following this plan the patient is satisfied and one is less likely to do harm with this than with any other form of food. Of course the benefit to the patient is chiefly imaginary.

So far nothing has been said of the operative treatment, intentionally, because the treatment I have just described was applied to all cases of acute appendicitis without regard to the severity of the case or the stage at which the patient was admitted to the hospital. Moreover, because this is the part of the treatment which is responsible for the enormous reduction in the mortality.

Operative Treatment.—The rule which was followed as regards the time of operation varied with the individual cases. In any given case, the operation was performed at the time the patient entered the hospital or if this occurred at night, on the following morning, provided it seemed clear from the condition of the patient that he would recover if the operation were performed at once, judging from my own experience in similar cases treated in the past. This could usually be expected in severe cases admitted before the end of thirty-six hours from the beginning of the attack and in the milder cases during a longer period.

In all cases in which the recovery seemed at all doubtful the operation was postponed and the patient was placed under the treatment described above until the acute condition had subsided. In some of these cases it became necessary to open a circumscribed abscess and later to make a second operation for the removal of the appendix. In other cases the inflammation became circumscribed and the appendix could be safely removed, the pus sponged out of the circumscribed abscess, the abdominal wound could be closed, a drain being introduced through a small incision two inches externally to the abdominal incision.

Of the 81 patients suffering from perforative or gangrenous appendicitis 37 were operated at once and 44 were treated for a period varying from four days to five weeks by the method described above before the operation was performed.

Of the 111 cases of acute appendicitis without perforation 107 were operated upon admission and four were subjected to the treatment described above for a number of days previous to the operation. It should be stated here that in each of these four cases I had diagnosed perforative appendicitis, because of the severe peritoneal irritation and also that among the 37 cases of perforative appendicitis which were operated at once there were several in which I had expected to find the infectious material still confined to the appendix at the time of the operation.

The 145 cases suffering from chronic recurrent appendicitis admitted during the interval between

attacks were all operated within a day after their admission.

In the cases which were first subjected to the starvation treatment the time of operation was chosen whenever the patient's condition seemed to indicate that the operation would be safe or whenever a circumscribed abscess had formed which could be opened externally without exposing the patient to the risk of infecting the general peritoneal cavity. The form of preliminary treatment described above was employed in all of those cases in which my former experience had taught me that the immediate operation would be followed by a high mortality, a class of cases which come to the surgeon on the third, fourth, fifth, sixth and seventh days after the beginning of the attack with severe distention of the abdomen, tense abdominal muscles, a bad facial expression, marked nervousness, pulse above 100, persistent nausea or vomiting *and always a history of having received cathartics and some form of liquid nourishment by mouth.*

The reason for operating all cases of acute appendicitis in which we could be reasonably certain that the infectious material was still confined to the appendix at once upon admission to the hospital have often been stated, but they are important enough to bear repetition: (1) There is almost no mortality in these cases if operated by a competent surgeon; (2) the patient will be permanently cured; (3) he will be disabled for work for only a short period of time; (4) his suffering is reduced to a minimum; (5) drainage will not be necessary, consequently there will be no postoperative ventral hernia; (6) all the other complications of acute appendicitis will be avoided, among these are most prominent, (*a*) peritonitis, (*b*) metastatic infection, (*c*) adhesions, (*d*) fecal fistula, (*e*) thrombophlebitis, (*f*) secondary infection of the pelvic organs in the female and consequent sterility.

On the other hand none of these complications can be avoided with certainty in case the operation is performed during the acute attack after the infection has extended beyond the tissues of the appendix; indeed an operation at this time favors all of these complications. On the other hand, these complications can again be avoided if the operation is performed in the interval.

The following statement will give the mortality:

Entire number of cases operated, 337; Number of deaths, 7; Mortality 2 per cent.+
Entire number of acute appendicitis, 192; Number of deaths, 6; Mortality, 3 per cent.+
Entire number of chronic appendicitis, 145; Number of deaths, 1; Mortality, 1 per cent.—

At this point I wish to state that every patient who applied for admission was received without regard to the severity of the case and that this list includes all of the patients who entered the hospital suffering from diffuse peritonitis resulting from appendicitis. Were these cases eliminated, the mortality would be almost ideally low, because three of the six patients who died in the group of cases suffering from acute appendicitis were virtually in a hopeless condition when they entered the hospital. Two of these were not operated, but their deaths are counted in order to make the statistics include all the deaths which occurred in patients treated for appendicitis during this period.

The case of chronic appendicitis would not have died had only the appendix been removed, the death occurring as the result of a hemorrhage from the ovarian artery, the Fallopian tubes having been removed and the ligature having cut through the artery.

I will add a short abstract of the histories of the fatal cases in order that a fair idea may be obtained of the character of these cases:

Case I.—A boy, four years old, who had formerly been in good health, became suddenly very ill after taking an unusually large meal followed by candy, nuts and fruit. He had complained of stomach-ache before taking this meal, but notwithstanding this he ate a large amount. The patient complained of pain in the region of the stomach and his mother attributed his condition to indigestion and gave him a large dose of castor oil. He came to the hospital forty hours after the beginning of the attack and it seemed to me likely that the entire infection would still be found in the appendix. I consequently operated at once, but found a perforated appendix and a diffuse peritonitis of which he died eleven days after the operation.

Had I not erred in my diagnosis and consequently not added the traumatism of the operation to the existing peritonitis, this patient would probably have recovered. The fact that the child lived eleven days after the operation would indicate that the peritoneum would have been capable of disposing of the infection, had not the traumatism been added.

Case II.—This patient, an emaciated man forty-four years of age, entered the hospital at the end of an acute attack, which had not been very severe. He had suffered from recurrent attacks of appendicitis at various intervals for a period of about twenty years. The last three attacks had been more severe and he was unable to recuperate from them. I operated at once and found a severely congested appendix, club shaped at the distal end and constricted at the cecal end. It was universally adherent to the lower end of the cecum and the distal end which contained a small amount of pus was adherent to the anterior surface of the iliacus muscle.

The appendix was dissected out and the wound was closed. The patient died on the seventh day from peritonitis. The autopsy showed a small amount of cloudy fluid in the pelvis. The infection had started from the tissues to which the club shaped end of the appendix had been adherent, the infection having evidently extended through the walls of the appendix during the late acute attack. This death could have been avoided by proper drainage. It is to be charged to faulty technic.

Case III.—This patient an anemic, emaciated, sickly boy, eight years old, entered the hospital on

the seventh day of an attack of acute perforative appendicitis with a rather mild form of diffuse peritonitis. His general condition was so bad that it seemed as though he would undoubtedly succumb to an operation. His condition never improved sufficiently to make the operation appear safe and it was postponed from day to day until the child died three weeks after entering the hospital. It is of course possible that this patient might have recovered had an operation been performed, but it did not seem so at the time.

Case IV.—This patient a strong, well-nourished man, thirty-nine years of age, entered the hospital on the tenth day after the beginning of an attack of acute perforative appendicitis. He was placed on the treatment by means of exclusive rectal feeding for four days during which time he improved greatly. At the operation a universally adherent appendix was found, extending down into the pelvis. It was perforated at the end and surrounded by an abscess containing half an ounce of pus. The appendix was enucleated, the pus sponged away and the cavity drained. The operation started a violent peritonitis of which the patient died fifty hours after the operation. Had the treatment with exclusive rectal feeding been continued for a week longer, until the virulence of the infectious material in the abscess had been reduced, this patient would undoubtedly have recovered.

Case V.—This patient, an exceedingly obese man, thirty-eight years of age, entered the hospital on the third day of an acute perforative appendicitis, suffering from diffuse peritonitis. He had been treated with calomel and large doses of saline cathartics repeated every hour during the day preceding his admission. He was in an absolutely hopeless condition, his pulse was almost imperceptible and his temperature 103°F. He died thirty-six hours after entering the hospital. No operation was performed. This patient's death was undoubtedly due to the administration of cathartics, because the severe symptoms did not appear until after this form of treatment was begun.

Case VI.—This patient, a millwright by trade, thirty-one years of age, entered the hospital on the fourth day of an attack of acute perforative appendicitis with a severe diffuse peritonitis. His pulse varied from 110 to 160 and his temperature reached 105°F. He was placed on exclusive rectal alimentation and his condition improved constantly. Ten days after his admission his temperature was 99°F. and his pulse below 100. There was a swelling and an area of tenderness in the vicinity of McBurney's point. I made an incision through the abdominal wall and found the intestines so diffusely adherent to the abdominal wall and to each other and to the omentum that I abandoned the operation and simply inserted a strand of iodoform gauze for drainage and left the wound open. The patient did well for a week, when an intestinal fistula formed, a few days later he had a hemorrhage; this was repeated on the second day and again a week later. He died thirty-six days after entering the hospital and twenty-six days after the operation from exhaustion due to the repeated hemorrhages from the fistula in the small intestine. In this case the death might have been avoided had the operation been further postponed. After the first hemorrhage it seemed as though the patient's weakness contraindicated an operation for locating and tying the bleeding vessel, which, however, I believe, I should do in the future in a similar case. The case occurred during our recent epidemic of typhoid fever and for a time I thought that the case was one of perforative typhoid ulcer, but the Widal test was negative.

Case VII.—This patient, a woman, thirty-four years of age, suffered from a chronic recurrent appendicitis complicated with secondary infection of both Fallopian tubes. The appendix and both Fallopian tubes were removed. The ligature applied to the stump of one of the tubes cut through the pedicle formed and the patient died from hemorrhage from the left ovarian artery. This death can, of course, not be attributed to the appendicitis operation, but it is counted because the operation was primarily undertaken for the relief of a recurrent appendicitis.

A review of these cases will show that the mortality could be further reduced by eliminating errors in technic.

I am certain that the very low mortality is due to the fact that the 48 patients in whom an immediate operation did not promise recovery were placed under proper preparatory treatment before the operation was undertaken and if this plan were generally adopted I have no doubt but what the mortality in acute appendicitis would be enormously reduced.

The lowest mortality following the operative treatment of acute appendicitis by any author who has operated upon a large number of cases, whose report I have been able to obtain is a little less than fourteen per cent., excepting the experience of Mayo, whose mortality in these cases is below three per cent., which he attributes to the fact that he follows the method described at the beginning of this paper in all cases in which there is any doubt concerning a recovery if an immediate operation is performed.

This method contemplates the removal of the diseased appendix at the very beginning of the attack before the remaining portion of the peritoneal cavity has been infected in all cases in which this is possible, and in cases in which this is not possible, because the infection has already passed beyond the tissues of the appendix it contemplates changing a very dangerous acute into a relatively harmless chronic condition by inhibiting peristalsis and giving the peritoneum an opportunity to remove the existing infection by absorption or to circumscribe it by forming adhesions, at the same time reducing the virulence of the infectious material. The following table shows interesting observations which my assistant, Dr. Ralph Daniells has made regarding the effect of this form of treatment upon leucocytosis.

He is still engaged in making these observations, which will be reported in another paper. I am not prepared to state whether these observations are of much practical value. They are certainly very interesting.

These two cases which he considers quite typical were in the hospital at the same time, the second one under the form of treatment described in the beginning of this paper and the first one under a form of treatment known under the ambiguous term of expectant treatment. In both cases the leucocytes were rapidly reduced under the starvation treatment, in the second case permanently. In the first case there was a rapid increase as soon as a slight amount of calomel and a little food were given. As soon as this was again prohibited the leucocytes at once dropped rapidly.

AGE	DATE	WHITE CELLS	CONDITION UNDER WHICH BLOOD WAS TAKEN
Male, 21	June 6	17,600	At time of entering hospital, acute perforative appendicitis fourth day of attack.
	June 7	15,800	Exclusive rectal feeding for twenty-four hours.
	June 9	10,200	Exclusive rectal feeding for 72 hours. Calomel given at end of this time, 2-10 grains.
	June 10	14,600	Calomel again given June 10 also a little soft food.
	June 15	23,400	This was continued for four days when all food and medicine was stopped by mouth on June 15th.
	June 16	20,600	At this time the patient was operated.

This case was under the care of a physician who did not fully appreciate the importance of absolute prohibition of even small amounts of food and cathartics by mouth at the time this observation was made.

Male, 19	June 11	9,100	At time of entering hospital, acute suppurative appendicitis.
	June 12	5,500	Exclusive rectal feeding employed at once.
	June 13	5,800	Exclusive rectal feeding.
	June 15	6,000	Exclusive rectal feeding.
	June 16	5,000	Operated. The infection was found confined to appendix.

This patient received the typical treatment described at the beginning of this paper.

The observations made during this year's experience again confirm the following conclusions, which are borne out by a very extensive clinical experience extending over a number of years:

1. The mortality in appendicitis results from the extension of infection from the appendix to the peritoneum or from metastatic infection from the same source.

2. This extension can be prevented by removing the appendix while the infectious material is still confined to this organ.

3. The distribution or extension of the infection is accomplished by the peristaltic action of the small intestines.

4. It is also accomplished by operation after the infectious material has extended beyond the appendix and before it has become circumscribed.

5. Peristalsis of the small intestine can be inhibited by prohibiting the use of every form of nourishment and cathartics by mouth and by employing gastric lavage in order to remove any substances of food or mucus from the stomach.

6. The patient can safely be nourished during the necessary period of time by means of nutrient enemata.

7. In case neither food nor cathartics are given from the beginning of the attack of acute appendicitis and gastric lavage is employed, the mortality is reduced to an extremely low percentage.

8. In cases which have received some form of food and cathartics during the early portion of the attack and are consequently suffering from a beginning diffuse peritonitis when they come under treatment, the mortality will still be less than four per cent. if peristalsis is inhibited by the use of gastric lavage and the absolute prohibition of all forms of nourishment and cathartics by mouth.

9. In this manner very dangerous cases of acute appendicitis may be changed into relatively harmless cases of chronic appendicitis.

10. In my personal experience no case of acute appendicitis has died in which absolutely no food of any kind and no cathartics were given by mouth from the beginning of the attack.

11. The mortality following operations for chronic appendicitis is exceedingly low.

12. Were peristalsis inhibited in every case of acute appendicitis by the methods described above—absolute prohibition of food and cathartics by mouth and use of gastric lavage—appendectomy during any portion of the attack could be accomplished with much greater ease to the operator and correspondingly greater safety to the patient.

I would make the following suggestions for the treatment of appendicitis with a view of reducing the mortality:

1. Patients suffering from chronic recurrent appendicitis should be operated during the interval.

2. Patients suffering from acute appendicitis should be operated as soon as the diagnosis is made, provided they come under treatment while the infectious material is still confined to the appendix, if a competent surgeon is available.

3. Aside from insuring a low mortality this will prevent a series of complications, mentioned elsewhere in this paper.

4. In all cases of acute appendicitis without regard to the treatment contemplated the administration of food and cathartics by mouth should be absolutely prohibited.

5. In case of nausea or vomiting or gaseous distention of the abdomen, gastric lavage should be employed.

6. In cases coming under treatment after the infection has extended beyond the tissues of the appendix, especially in the presence of beginning diffuse peritonitis, conclusions four and five should always be employed until the patient's condition makes operative interference safe.

7. In case no operation is performed neither nourishment nor cathartics should be given by mouth until the patient has been free from pain and otherwise normal for at least four days.

8. During the beginning of this treatment not even water should be given by mouth, the thirst being quenched by rinsing the mouth with cold water and by the use of small enemata. Later small sips of very hot water frequently repeated may be given and still later small sips of cold water. There is danger in giving water too freely.

9. All practitioners of medicine and surgery, as well as the general public should be inpressed with the importance of prohibiting the use of cathartics and food by mouth in cases suffering from acute appendicitis.

10. It should be constantly borne in mind that even the slightest amount of liquid food of any kind given by mouth may give rise to dangerous peristalsis.

11. The most convenient form of rectal feeding consists in the use of one ounce of one of the various concentrated liquid predigested foods in the market, disolved in three ounces of warm normal salt solution introduced slowly through a soft catheter, inserted into the rectum a distance of two to three inches.

12. This form of treatment cannot supplant the operative treatment of acute appendicitis, but it can and should be used to reduce the mortality by changing the class of cases in which the mortality is greatest into another class in which the mortality is very small after operation.

710 Sedgwick Street.

PROMPT OPERATION IN THE BEGINNING OF THE ATTACK WILL SAVE NEARLY ALL CASES OF APPENDICITIS.

BY A. C. BERNAYS, M.D.,

OF ST. LOUIS, MO.;

SURGEON TO THE LUTHERAN HOSPITAL; CONSULTING SURGEON TO THE CITY AND FEMALE HOSPITALS.

THE opinions of surgeons and physicians in regard to the treatment of appendicitis have been recorded and published in over two thousand separate communications to the medical press of Europe and America. No doubt the other continents have also contributed their share, and a complete bibliography would require years to compile, and would be an exhibition of the greatest industry on the part of our profession. It would show a singular variety of views and of conclusions. It would also demonstrate a marked change in the views of the same observers, as well as a slow, but certain, increase of voices in favor of the surgical treatment of the disease as soon as its existence is recognized.

The reason why we have been slow to arrive at a final and universally accepted method of treating appendicitis is, that the exact pathological condition in a given case cannot be diagnosed. The existence of appendicitis can be proven in nearly all cases, and particularly is this true in the acute stage of attack. But having made the diagnosis of appendicitis, we are unable to describe or to form a reliable opinion about the exact anatomical condition which we have in the abdomen, and we cannot usually give a detailed, or even approximate picture of the pathological processes which will be found after the belly is opened. We have no method of diagnosis which will enable us to predict the exact nature of the involvement.

(1) We cannot know the position of the appendix; (2) we cannot know the size of the appendix; (3) we cannot know the shape of the appendix; (4) we cannot know whether the proximal or distal end, or whether the whole of the appendix is affected or not; (5) we cannot know whether there is a foreign body or not; (6) we cannot know whether there is stricture or or not; (7) we cannot know the exact extent of the peritonitis; (8) we cannot know whether there is a peritoneal effusion; (9) we cannot know the species or kind of infection; (10) we cannot know whether there is perforation of gangrene.

All men who have operated on more than one hundred cases will agree with the above statements; all who have operated on over five hundred cases will agree that there are many more details than I have mentioned, which they cannot know before opening a belly. Nearly all those who have operated on a few cases, will not so readily admit their ignorance, and nearly all those who have never operated on an acute case of appendicitis, but who have treated a large number without operation, who cannot possibly know anything about the exact pathological condition that they are treating will have more or less vague notions about the pathology of appendicitis, according to each one's own imagination and credulity.

Scientific investigation has nothing to do with imagination and beliefs, and dreamers and speculators are barred from our discussions. Let us listen only to those who have made autopsies either on the dead or on the living. The experience of the others is valuable in a very limited sense. It is about like that of a blind man at a horse race; he either cashes or tears up his ticket after the race, just as the physician either writes a death certificate or celebrates a cure; but neither of the two has learned a lesson which can be of use to those who come after him, searching for knowledge and advice.

Knowing that we can know little or nothing of the pathological process in the belly before it is opened, except that it started in the appendix, and knowing that we cannot foretell what course an unknown process will run, what must we do?

Before answering this question, I desire to

make a few remarks closely in line with the above observations. In cases of appendicitis an exact diagnosis, if it could be made in regard to the pathological lesions present, would include the prognosis, and would indicate to us when to operate and when to proceed with expectant treatment. As I have said above, it is almost impossible in any case to make an anatomical diagnosis, particularly to foretell the exact appearance of the appendix, or to form a correct idea of the existing form and nature of the infection.

The classification of the Germans and of the French writers, for instance, Sonnenburg, into (*a*) simple, (*b*) perforative, (*c*) gangrenous, is of no value to the practitioner of medicine or surgery, because he is expected to decide whether to operate or not; and he must particularly decide whether or not the disease of the appendix, no matter in what form, will be limited to the appendix and its immediate neighborhood, or whether or not it will spread and reach the general cavity. If he could decide that the disease will be localized or limited, an operation might not be needed at once, but he cannot decide this point with reasonable certainty. The assumption that the local and general symptoms will be mild in limited circumscribed cases is true only in a restricted sense, because we do not know at what moment a rapid pulse, severe, alarming, general disturbances may set in, showing us that an apparently simple appendicitis, with no bad symptoms, may suddenly become a violent, fulminating, fatal attack. The severest symptoms are sometimes found in cases in which very insignificant local disturbances are found. Sometimes a little localized pain on pressure is all that can be found. This symptom is all that is required to justify an operation, although it does not always indicate or call for operation. I would rather defer surgical interference where there is dulness and a plain tumor, than in those cases in which there is no circumscribed tumor, but probably a liquid exudate. *The absence of a tumor is a more pressing indication for immediate surgical interference than its presence.*

Appendicitis is not a typical disease, if viewed from a clinical standpoint. In at least one-half of the cases there is no dulness to indicate the existence of an exudate or tumor in the right iliac fossa. Again, I have seen a well-defined dulness disappear in a day, an occurrence which means a decidedly dangerous change, requiring immediate operation, because the clearing-up of the dulness is most probably due to entrance of air into the abscess. Again, we see that the presence or absence of dulness and tumor are most misleading and unreliable symptoms upon which to base an exact diagnosis, or upon which to rest either an operative or expectant plan of treatment.

Whenever an operation for appendicitis is performed within twenty-four hours after the attack, it is successful in about 98 per cent. of all cases thus treated. I object to having these operations called early operations. They are always operations done at the correct and proper time. The term "early" is likely to produce opposition and objection in the mind of a timid, vacillating surgeon. These gentlemen, who like to be called conservatives, will often side with the internist in a consultation if there is talk of "early" instead of proper and prompt operation. I saw a boy die of appendicitis who would have been saved by operation, but the word "early" killed him. Words are more dangerous than knives at certain times.

In regard to the statement that an amelioration of symptoms justifies delay and may be regarded as a contraindication to operation, I have this to say: I have shown that the nature and present stage of the progressing pathological process is unknown to us, and cannot be interpreted by the most experienced of us from an analysis of symptoms. I have seen quite a number of deaths, after an amelioration of symptoms which seemed to indicate a favorable outcome of the attack. Having been refused the operation during an apparent amelioration, I have operated five, six, seven and nine days later, and have had two deaths out of four cases. I have previously said that the division of appendicitis into three classes, on pathological findings, is of no practical value. This is true, because the three kinds of appendicitis cannot be differentiated clinically, nor can the many complications of the three classes be recognized during life, except by abdominal section. An amelioration of symptoms does not justify delay in operating, because it may be only temporary, and the patient may be lost on account of procrastination.

I have not the time to touch upon those as yet too numerous cases which are first seen by a surgeon from five to fifteen days after the beginning of the disease. Here we often have the clinical picture of septicemia. The attending physician has treated the case with opium, morphine, ice-bags or poultices, and has lulled himself and the friends of the patient into a hopeful mood of security. In such thoroughly mismanaged cases it is a fight between the human organism and the toxins, and in this class of cases the Ochsner treatment is probably the best method to be followed out, because there is a probability of autoimmunization taking place. Surgery can do but little beyond draining abscesses in these cases, until later on, an interim operation for the removal of the remnants of the appendix is indicated, if the patient survives. It is these cases of septic peritonitis where the Ochsner method seems to me to find its only field of usefulness. I have used this method before and since Ochsner's publication, in cases of peritonitis in which there was intestinal obstruction, supplementing it with one or more enterostomies through which intestinal drainage and lavage could be extensively carried on. (See Address before the Iowa State Association of Railway Surgons, at Ottumwa, Iowa, 1897.)

Sprengel, at the German Congress of Surgeons, held in Berlin in April, 1902, proposed a

collective investigation of the appendicitis question, and propounded the following three questions, to be answered by all operators he could reach:

1. How does the danger of the early operation compare with that of the interval?

2. Has the early operation any special dangers compared to the interval operation?

3. What are the results of early operation in comparison with the late operation, and how do the results compare in different stages of the disease?

I would answer as follows: (1) The mortality of the interval operation is very low; taking all cases together, I have had no death in over four hundred operations. It will not reach one per cent., whereas the mortality of operations during an acute attack will reach from four to twenty per cent., taking all cases together. The mortality will vary according to the indications and methods followed by the individual operators. My own mortality in the last one hundred cases was three. My mortality in 566 cases operated during the last fifteen years reaches 9½ per cent. I think it is lower now, because I do not encourage radical operations in septic cases seen late in an attack in which there is a chance to save the patient by drainage, enterostomy and gastric and colonic lavage. (2) Aside from the greater danger from anesthetics in acute cases, I would answer, no. The results of the very early operation, say in the first twenty-four to forty-eight hours, will probably be as low as those of the interval operations. I have had only fifty-six very early operations, and had only one death from chloroform among them. (3) Operations done during the first day or two are easier and more complete than later operations. The results of early operations are more satisfactory than late operations. The results are most gratifying in the worst cases of peritonitis, with free effusion, if done early enough.

In conclusion, let me say that I think this question of appendicitis can be scientifically solved when we have advanced far enough to compare similar stages and similar pathological conditions with each other, and cease trying to solve this many-sided problem as an undivided whole. My answer to the question, What must we do? is, Operate Early in the Attack!

MEDICAL PROGRESS.

HISTOLOGY, PATHOLOGY AND BACTERIOLOGY.

On Transplantation of Urine.—The results of certain experiments performed on rats have already been reported by L. LOEB (Am. Med., March 14, 1903), who now supplements these by others. In the first series he endeavored to determine the resisting power of excised pieces of tumor to unfavorable conditions. Pieces of a sarcomatous thyroid tumor from a rat when transplanted after varying periods of sojourn on ice, all grew in their new site. The effect of heat was also tried and the power the transplanted tumors was weakened after exposure for 15 to 30 minutes at a temperature of 43° to 45° C. Pieces which after extirpation were kept in glycerin, showed positive results in only a few cases, insufficient to warrant any conclusion. The influence of bacterial products on the growth of transplanted tumors is as follows: if the infection reaches a certain severity, no growth takes place, or if not severe enough in the beginning, it will do so later. Sloughing necrotic nodules may likewise be covered by healthy tissue, and growth is slow or stops. By the injection of the fluid from a cystic sarcoma into the peritoneal cavity, sarcoma resulted in some cases and not in others, and this probably due to the fact that different tumors of similar structure may have a very different faculty to infect other tissues by mere contact. Injection of juice from tumor tissue minced in sodium chloride (7-per-cent.) solution and passed through a Berkefeld filter failed to produce any growth. The same took place if only ordinary filter paper was used. These experiments seem to warrant the conclusion that a micro-organism living outside of tumor cells and passing through the Berkefeld filter is not, in all probability, the cause of the formation of sarcoma in rats, nor is one resembling organisms like the tubercle bacillus or the blastomycetes. These would probably not be made ineffective by heating to 45° C. for half an hour. No giant cells characteristic of granulomas caused by the tubercle bacilli or blastomycetes could be found in these sarcomas. The remaining possibilities are that sarcoma is caused by an organism outside the tumor-cells, possessing, however, a similar sensitiveness to heat as the tumor cells themselves. Such, however, would have to be larger than red blood cells, as they seem unable to pass through filter-paper. The author thinks this is improbable, as microscopic examination showed no structures other than tumor cells and their products of degeneration. We may also conclude that no organism sensitive to cold can be the cause.

Four Cases of Primary Actinomycosis of the Lungs.—Ever since J. Israel published the histories of nine cases of primary pulmonary actinomycosis, numerous instances of this disease have been reported. In two of the cases observed by S. KASHIWAMURA (Virchow's Archiv, Feb. 2, 1903) the primary nature of the disease is easily proved. In both instances the clinical history began with catarrhal conditions in the lungs and a sequent pleurisy, and at autopsy no evidences of actinomycosis were found outside of the respiratory tract. In the other two cases, the first clinical manifestation was a pleurisy; nevertheless there were other widespread processes, namely, extensive changes in the subpleural and retroperitoneal tissues and in the ribs. These latter changes may have been secondary to the condition in the lungs. The abundance of connective tissue formation in these organs indicated that they were probably the oldest localization of the disease processes. The relatively less extension of the pathological changes in the lungs than in the surrounding tissues, does not militate against the idea of their primary nature, for it is well known that actinomycosis spreads more rapidly in the prevertebral connective tissue and neighboring parts than in the lungs. The esophagus is frequently the portal of entry for the disease, which then gradually extends deeply and penetrates the lungs. None of the author's cases showed any such course. There were in two of them genuine metastases in the liver and skin respectively. As regards the etiology of this disease, the cases reported add nothing of definite value. In two of them there were carious teeth. According to Boström the cereal grains are frequent carriers of the infective material. None of the author's cases revealed any etiological relationship of this character. The changes

in the lungs showed a decided tendency to connective-tissue formation. The bronchi either show a cellular infiltration of their walls or pass immediately within the grasp of the newly formed connective tissue.

The Origin of Fatty Changes in the Organism.—In an investigation of this interesting subject, J. ARNOLD (Virchow's Archiv, Vol. 171, No. 2) came to the conclusion that in various processes, which have hitherto gone under the name of "fatty degeneration," the fat does not result from the disintegration of albumin, but is or can be deposited from without. The current terms, "fatty infiltration," "fatty metamorphosis," "fatty degeneration," "fattening," and the various theories regarding the origin of these changes, require a radical reform. With this in view, the author suggests the following classification of the different forms. *A. Exogenous lipogenesis,* the intracellular formation of fat according to the principle of the synthesis or phagocytosis of fat: (1) Physiological wandering of fat, corresponding to the changing nutritional conditions of the fatty supply. (2) Wandering of fat in forced feeding with fat-producing foods; various degrees of fattening (with or without secondary degeneration). (3) Wandering of fat as the result of the rupture of fat into the circulation, *e.g.,* fat emboli. (4) Pathological fat metamorphosis; fatty infiltration (the pathological destruction or construction of wandering fat according to the principle of synthesis or phagocytosis. (*a*) Simple forms (without degeneration or with reparable degeneration). (*b*) Necrobiotic forms (fat synthesis or phagocytosis, complicated with phenomena of disintegration). *B. Endogenous* (albuminogenous) lipogenesis, the intracellular production of fat from the disintegration of albumin, (fatty degeneration).

Immunization of Cattle Against Tuberculosis.—The effect of human tubercle bacilli on cattle has been investigated by L. PEARSON and S. H. GILLILAND (Proc. Path. Soc., Phila., March, 1903), and from their experiments they conclude that after repeated intravenous injections of cultures of tubercle bacilli from human sputum, the resistance of young cattle to virulent tubercle bacilli of bovine origin may be increased to such an extent that they are not injured by inoculation with quantities of such cultures that are capable of causing death or extensive infection of cattle not similarly protected. By intravenous injection, much larger quantities of cultures of human sputum tubercle bacilli than are necessary to confer a high degree of resistance or immunity upon the vaccinated animal, may be administered without danger to that animal. Experiments are now under way for the purpose of testing the duration of this immunity and the extent to which it is effective in protecting cattle against infection from natural sources.

The Bacteriology of Pulmonary and Bronchial Suppurations.—The question of a mixed infection in pulmonary tuberculosis still remains undecided. Most investigators at the present day, ascribe the destructive processes in the phthisical lung and the hectic fever to the presence of other germs. A very complete study of this subject has been made by H. KERSCHENSTEINER, (Deut. Archiv f. klin. Med., Vol. 75, Nos. 3 and 5), who examined very carefully the sputa from a large number of cases presenting suppurative processes of the lung and bronchi. The results obtained were somewhat contradictory in certain respects and are summarized by the author as follows. The flora of the sputum of a phthisical patient differs from that of other cases of pulmonary or bronchial suppurations, only in the fact that the tubercle bacillus is present in the former. The streptococci are the most frequently found germs of purulent sputum, whether derived from tuberculous or non-tuberculous patients. In tuberculous cases, staphylococci, tetragenes, and diphtheria-like bacilli are also frequently found, in non-tuberculous cases, tetragenes. The various micrococci, pneumococci, influenza bacilli, and the colon group are less frequent with tuberculosis. In non-tuberculous suppurative bronchitis, influenza bacilli and pneumococci are more numerous in comparison but the diphtheria-like bacilli and especially staphylococci, are much less frequent. A well-marked difference does not however exist. Streptothrix and blastomycetes were found sporadically. Acid resisting pseudo-tubercle bacilli and pyocyanus were not seen. Experiments were made by injecting into the trachea of rabbits, a quantity of tubercle bacilli together with *Micrococcus tetragenes.* A rapid disintegration took place in the lung, resulting in the formation of a large cavity within four weeks' time. Trials on the human subject showed that cultures of streptococcus from a tuberculous lung, which exhibited a moderate amount of virulence in rabbits, were also pathogenic for a healthy individual. This was shown by the production of a localized erysipelas at the point of subcutaneous injection. Among other things, it was also found that with undoubted pseudo-diphtheria bacilli, Neisser's granules as well as acid production, could be present, which fact invalidates the determination of these two conditions in the diagnosis of the bacillus of Löffler.

Investigation of Perspiration.—A series of investigations with the sweat of human beings has been made by L. BRIEGER and G. DIESELHORST (Deut. med. Wochenschr. No. 10, 1903). Their first communication is concerned with the subject of cryoscopy. Determinations of the freezing point as well as the specific gravity, in both sick and well persons, show that these two factors are entirely dependent on the amount of sodium chloride which the exuded perspiration contains. It is therefore probable that the individual variations in the osmotic pressure of the sweat are mainly governed by the varying quantities of salt which it contains. The average lowering of the freezing point of the sweat is approximately the same as that of the blood. The quantity of sodium chloride in the drops exuded at first is regularly less in amount than in those voided later on.

Bacteriology of Scarlatina.—A series of experiments have been made by G. H. WEAVER (Am. Med., April 18, 1903), with reference to the bacterial flora of this disease. Cultures were made from the material upon the surface of the tonsils as early in the disease as possible, and from the skin before and after desquamation. The author's observations lead to the following conclusions: (1) The bacteria obtained from cultures from the skin, epidermic scales and the surface of the tonsil in cases of scarlatina are the same as those found in the same locations in health, and no one of them is constantly present except the streptococcus in the throat. (2) Because of the numerous cocci which grow in such cultures, and which appear in groups of two or four or bunches of the same under the microscope, it is impossible to identify them, except by a complete study in pure culture. (3) Cultures made by inexperienced persons or by those who do not fully appreciate the importance of avoiding the tongue are especially apt to contain large diplococci or sarcinæ. (4) The streptococcus is present upon the tonsil of scarlatinal patients in enormous numbers in almost all cases.

Influence of the Nerves upon the Healing of Fractures.—Recent experimental work by Kapsamener, Muscatello and Damascelli has proven that normal healing of fractures takes place in limbs which have been artificially deprived of innervation through section

of the sciatic nerve, crural nerve or brachial plexus. R. PENZO (Gazz. Osped., March 29, 1903) has studied in rabbits the influence upon osseous repair of the vasoconstrictor fibers alone, through extirpation of the superior cervical ganglion of the sympathetic followed by fracture of the zygomatic arch. For purposes of comparison, section of the fifth nerve was practised in three rabbits. The author sums up the results obtained as follows: In the reparatory neoformative process which follows fracture of the zygomatic arch in rabbits, the vasoconstrictor fibers of the sympathetic nerve play an important part. The active hyperemia following suppression of these fibers favors and hastens the formation of callus, through the proliferation of cellular elements which it induces. This indirectly favorable influence which vasomotor paralysis exercises through induction of active hyperemia, may explain the more perfect healing of fractures with impaired innervation which has been noted by some observers. Section of the fifth nerve alone has no apparent influence upon the healing of fractures; and this fact suggests the possibility that abolition of motion and sensibility alone, do not suffice to retard the process of osseous repair.

Beriberi on Board Ship.—Among Lascar crews this interesting disease is a common occurrence and because of the controversy as to its etiology, it is interesting to note that it may occur to all appearance spontaneously aboard ship. The case cited by D. W. K. MOODY (Brit. Med. Jour., March 28, 1903), as occurring on one of the steamers of the P. & O. line, in which the Lascars have the same space as is allowed the European seamen, is of more than ordinary interest because it supports the rice theory of infection. The anemic theory is exploded. The cockroach theory has also little ground. The metallic theory supported by many intelligent men, can likewise be set aside. One is therefore, by a process of exclusion, obliged to fall back on the rice and germ theories. The author believes that rice is a prime factor in causing the disorder and that probably the germ, whatever it is, is intimately connected with the grain. Certain it is that rice alone will not give rise to beriberi, since it is unknown among the rice-eating millions of Bengal. If the scale of provisions for Lascars of the Board of Trade regulations be examined, it will be noted that rice forms the great bulk of the food, albeit the classic lime juice and other antiscorbutics are well represented. In the Japanese army and navy, in 1884 and 1885, beriberi was a serious complaint, but it was almost entirely eliminated by the introduction of barley into the diet along with the rice. There are cases on record in which the crews of vessels suffered from beriberi continuously until the rice rations were thrown overboard and a fresh supply obtained. The prognosis on beriberi must be very guarded, as it is essentially in the matter of death and recovery a disease of surprises.

Pathological Conditions in Prehistoric Skulls.—An interesting series of observations has been made by W. WRIGHT (Birmingham Med. Rev., Feb., 1903), on a large number of prehistoric skulls found in Yorkshire, England, and belonging in part to the Neolithic and Bronze Ages, and in part to the Early Iron Age. The abnormalities were chiefly either of the nature of well-marked asperities for the attachment of muscles or of unusually prominent bony processes. One instance of a partially ossified falx cerebri was noted. True pathological conditions were but rarely encountered. Of all the teeth examined only one was found to be carious. The occurrence of alveolar abscesses was indicated in five cases, only one of which was due to a carious molar. The comparative immunity of the molars was seemingly due to the rapid wearing away of their crowns to a flat surface by the dirt and grit mixed with the coarsely milled grain, and by the pulps being quickly calcified. Of fractures there was only one clear case. It was an elevated fracture of the frontal bone above the right orbit and had healed with but little deformity. Several cases showed evidences of dislocation followed by subsequent deformity and well-marked depressions were also present in a number. Certain conditions suggestive of syphilis were observed. The nasal bones of one skull were unusually small and the nasal arch was sunken in. In another a diffuse smooth elevation was discernible on the buccal aspect of the hard palate. There was also a peculiar thickening of the frontal and parietal bones as they bound the coronal suture and symmetrical nodosities on either side of the anterior part of the sagittal suture. No evidences of rickets were encountered.

THERAPEUTICS.

The Value of Mercurial and Phenol Preparations as Disinfectants.—The comparative value of the older and newer preparations has been made the subject of bacteriological experiment by F. HAMMER (Münch. med. Woch., March 10, 1903). He employed pure cultures of *Staphylococcus pyogenes aureus* and anthrax spores, with which silk threads were infected and exposed to the action of the various compounds. The results show a greater activity of the inorganic, as compared with the organic mercurial compounds. Undoubtedly this depends on chemical combination and not on the amount of the metallic mercury. The methylphenols are more powerful than the benzophenols. It may be stated that a 5-per-cent. carbolic solution only equals in disinfecting power a 3-per-cent. creosol solution. In comparison with the mercurial compounds especially sublimate, the phenols have practically no effect on anthrax spores, but on the contrary exhibit a most marked effectiveness against aureus. It is also to be noted that lysoform is by no means as effective as formalin and shows poor results in both varieties of bacteria. The author's conclusions are that different varieties of bacteria are not affected alike by any one preparation. He points out that for each group therefore we must select the agent which has been experimentally proved to be the most effective.

New and Unusual Therapeutic Applications of Ergot.—That many varied disorders which have been regarded from the purely nervous standpoint are due to circulatory disturbances around and about those nervous structures whose functional derangements are noted is the conclusion reached by A. T. LIVINGSTONE (Jour. Am. Med. Assoc., March 21, 1903). He considers, therefore, that the indications do not call for nerve tonics and stimulants, but for means that tend to equalize and tone the circulation. Ergot seems to fulfil the latter requirements most satisfactorily. He has used it with success in insomnia, headaches (especially congestive), eye and ear disorders and pain in general. Morphine and opium poisoning and drug habits were also benefited, as were delirium tremens, hystero-epilepsy, chorea, paresis. He also recommends it in acute inflammatory and zymotic diseases, in typhoid, in angina pectoris, as a preliminary to operation, and in shock. The effect in all these is directed to abnormally dilated blood-vessels. The preparations to be used are the hermetically sealed aseptic bottles or the author's solution which consists of one dram of Squibb's extract of ergot dissolved in one ounce of formalin solution (1-3,000). The dose by hypodermic injection, preferably into the deltoid muscle, is from 15 to 30 minims, repeated in half hour, if necessary. The writer has seen ergotism occur in very rare cases only.

THE MEDICAL NEWS.

A WEEKLY JOURNAL

OF MEDICAL SCIENCE.

COMMUNICATIONS in the form of Scientific Articles, Clinical Memoranda, Correspondence or News Items of interest to the profession are invited from all parts of the world. Reprints to the number of 250 of original articles contributed exclusively to the MEDICAL NEWS will be furnished without charge if the request therefor accompanies the manuscript. When necessary to elucidate the text illustrations will be engraved from drawings or photographs furnished by the author. Manuscript should be typewritten.

SMITH ELY JELLIFFE, A.M., M.D., Ph.D., Editor,
No. 111 FIFTH AVENUE, NEW YORK.

Subscription Price, including postage in U. S. and Canada.

PER ANNUM IN ADVANCE	$4.00
SINGLE COPIES	.10
WITH THE AMERICAN JOURNAL OF THE MEDICAL SCIENCES, PER ANNUM . .	8.00

Subscriptions may begin at any date. The safest mode of remittance is by bank check or postal money order, drawn to the order of the undersigned. When neither is accessible, remittances may be made, at the risk of the publishers, by forwarding in *registered* letters.

LEA BROTHERS & CO.,
No. 111 FIFTH AVENUE (corner of 18th St.), NEW YORK.

SATURDAY, MAY 2, 1903.

LONGEVITY AND MEDICAL SOCIETY INTEREST.

AT this season of the year when the larger medical societies all over the country are holding their annual meetings, it is interesting to note how many of the men who were prominent in the original foundation of medical societies, who were ready to give of their energies and still more of time that was precious to them, for they were all of them eminently busy practitioners of medicine, lived to good round old ages. It is almost as if Providence deliberately made up to them for time spent in the service of their fellows by an extension of life beyond the Psalmist's limit of three score years and ten, more than enough to compensate them for sacrifices made.

In our present issue of the MEDICAL NEWS, on the eve of the meeting of the American Medical Association, we give a place in the department of Excursions in Old New York Medicine to a portrait and short biographic note of Dr. John Stearns, founder of the Medical Society of the State of New York, from which organization, some forty years later, was to come, not a little because of Dr. Stearns' initiative, the idea of the foundation of the National organization that now means so much for professional interests in the United States.

We believe that this is the first portrait of Dr. Stearns that has ever been printed. It is a copy of an oil painting of the distinguished first president of the New York Academy of Medicine, executed in 1842 and said to be a much more faithful and lifelike "counterfeit presentment" of him than the oil painting possessed by the Academy. We owe the photograph from which this has been taken to the kindness of Dr. H. S. Stearns, of New York City, the great-grandson of Dr. Stearns, the subject of our sketch.

Like every one of the presidents of the New York Academy of Medicine for the first ten years of its existence, with the single exception of Dr. Francis, the second president, who lived to be only seventy-two, Dr. Stearns passed the seventy-fifth milestone of existence still capable of hard and fruitful labor. In fact, so many of the Academy Presidents have been almost or quite octogenarians, that it has been well said that it is practically an assurance of longevity to be elected to the presidency.

It would be interesting to know how many of the men who deservedly attained positions of honor in the prominent medical societies of the country reached a happy, hearty old age. We venture to say that the list would be a very long one, for it is the man of temperament that begets confidence in his fellow professional men who is apt to have the poise of faculties and the smoothness of disposition that guarantees against the inroad of petty annoyances and who thus escapes the attrition of worry so much more wearing on vitality than work. Meantime this simple recipe for successful longevity founded on long years of clinical experience is commended to the practitioners of the country. Take liberal, frequent doses of interest in medical society affairs and take office early and often whenever you can.

A MODERN BLACK HOLE OF CALCUTTA.

NOT long since the city instituted a new era in public hygiene by isolating its tuberculosis patients in the old buildings formerly occupied by the Manhattan State Asylum for the Insane, situated on Blackwell's Island. Everyone appreciated that this move was one in the proper direction, but unfortunately it has served to be not only a beginning but an ending as well. By the time the various hospitals were cleansed the capacity of the new institution was overtaxed, and the end in view was defeated, for the hos-

pitals were in a very short time again filled by consumptives.

An hour's investigation at the City Hospital on Blackwell's Island will prove a fruitful source of knowledge to those interested in matters hygienic. Disregarding the wards for the patients a peep into the quarters occupied by the "helpers" will afford interesting food for thought.

In a ward which formerly accommodated but eleven patients, there are now twenty-four cots for "male helpers" to occupy at night-time. A visitor passing through the room on an afternoon would admire the apparent orderliness of this ward with its neat little cots symmetrically placed in rows, covered with gray army blankets arranged with true military order and precision. Nightfall brings the transformation. On a summer's night the stench of this room is bad, but in winter it passes description. The men shun fresh air and lavage, and ventilation is considered more dangerous than disease. They cast their dirty clothes upon the floor and spread the dirt from them in all directions. Undressed they wander about the room in their bare feet picking up the dried sputum, and then take into their beds the bacteria of their tuberculous room-mates. How long will it take such conditions to react upon their lowered condition of vitality? The paid helper is drafted from the rank and file of the convalescent patients who are not sick enough to be kept in the wards, but who remain in the hospital for want of a better place to go. Many of them are tuberculous, and in their ignorance, they carelessly expectorate upon the floors of their dormitories and thus subject their fellow miserables to the possibility of infection. It is not difficult to conjecture the outcome of such a state of unhygienic pestilence as this. Ere long they find their way into the medical wards to succumb to the final onslaught of the white plague.

Strange as it may seem, there is entire indifference felt for the lives of these creatures, so ignorant and helpless. They are permitted to live huddled together, no measures being taken to teach them or even compel them to live hygienically. A few rules as to ventilation would help them to be more comfortable, but they are simply the world's outcasts for whom no one has a single thought. They are indeed a curious conglomerate mass. Some of them have occupied responsible positions in the affairs of this city and have in time past seen affluence. There is an ex-member of the Stock Exchange whose seat is even to-day retained in his name by his relatives. There are gradations in the social scale from the ex-financier to the congenital "hobo." All live together in the filth and mire of unhygienic surroundings.

Such a necessity as a bath-tub is not convenient enough to them to let it enter their thoughts. There is one that they may use, but it is not an exceedingly popular thought to their minds.

Back of the hospitals is a low, rambling building, constructed after the plan of weather-proof, summer, seaside cottages, which building is known as the Klondyke. Its name is only too suggestive in winter. Here are the main quarters of the male "helpers." Here, in the colder months, bronchitis, pleurisy and pneumonia are prevalent and, sooner or later, those afflicted are turned over to the tender mercies of the tubercle bacillus.

The lot of the female helpers is equally cheerful. They are housed in an old shack of an outhouse, which, in days gone by, was used by the hospital as a waiting ward for pregnant women. It is infested by mice and rats and many other varieties of vermin. The former Commissioner of Public Charities condemned this structure as uninhabitable and unsafe, ordered the patients to be removed from it, and had its doors closed. A coat of paint has been given to it, and it is now turned over to the poor miserable creatures who serve the city in the capacity of helpers for a monthly stipend varying between the liberal amounts of four and eight dollars a month.

If the services of these individuals are of any value to the city, it would seem only reasonable that this value should be increased by a little attention to their comforts or necessities. It is true that they belong to the lowest stratum of humanity, but dumb animals receive more care and attention than these unfortunates. Situated as they are, they can only act as a menace to those near them, and perhaps may infect the bodies of those whom we consider more valuable in the scale of human worth.

The recent erection of canvas tents on the grounds about the hospital is but a drop in the bucket. How long must we wait for the politicians at Albany to get their "graft" before the City's and State's poor can be taken care of?

THE CAUSE OF SMALLPOX.

DRS. W. T. COUNCILMAN, G. B. MCGRATH, and W. R. BRINCKERHOFF of the Harvard Medical School at the meeting of the Boston Society of Medical Sciences held Tuesday evening an-

nounced the demonstration of the micro-organism which occasions smallpox. It is a protozoan and not a vegetable cell, has, like many other protozoans, two distinct cycles of development, and can be demonstrated in the "protopustule" (the vaccination vesicle), in the papule, and in the pustule, and was once clearly seen in a photograph in the blood. Scores of actual photographs, some made with a magnification of two thousand diameters, show conclusively every stage of this double cycle in the actual tissues of the early stages of smallpox. No pure culture has been made because of the lack of a medium which will nourish the animals. The spores of the protozoan, as yet unnamed, are about one micromillimeter in diameter, the mass of the protozoan about twelve microns across. The sexes appear to be distinct, one of them developing in the cytoplasm only of a tissue cell, the other in the nucleus. The first cycle of development occurs in the cytoplasm and Dr. E. E. Tyzzer has demonstrated that the process occurring in vaccinia covers only this half of the bisexual development, vaccinia therefore being a mild disease.

Very early in smallpox a minute round object with a black center (as stained) may often be seen in epithelial cells. This multiplies and becomes a mass which soon causes the complete disintegration of the cytoplasm affected and divides into a mass of spores, of one sex only probably. In variola the nucleus then becomes infected, and the spore develops into a "ring" surrounding a vacuole. The ring grows, becomes a mass of "rings" which solidify into a solid mass more or less filling the nucleus and causes thereby the destruction of the latter. This solid mass gradually breaks up into spores which by the disintegration of the nucleus are set free and undoubtedly are present in vast numbers in every pustule of smallpox, although they are not easily demonstrable there owing to the absence of a stain which will make them conspicuous.

Thus there is demonstrated the entire life-history of this "germ" so far as it takes place in the affected tissues. The reason it has not been pointed out before apparently is that searchers have confined most of their work to the pustules and little or none of it to the tissues early in the disease, during, in fact, its period of incubation. By the time the pustule has been formed, the two cycles of development and sporulation are complete and the spore is invisible, probably in the bottom of the pustule.

Dr. Councilman thinks that this protozoan is not the only organism responsible for the phenomena of smallpox, but that the streptococcus and perhaps other of the common bacteria aid in the destructive degenerations of the disease after the lesions have been started by the highly ruinous ravages of the infecting protozoan multiplying in the tissues. Much certainly remains to be learned even with this the greatest step taken. How can a pure culture be made and through that an antitoxin? Why do the spores when they infect a monkey or a man pass through both sexual phases or cycles and when they infect a rabbit or a cow only one? How does the development in the organism of one of the sexual cycles only make that organism immune against danger from the two-cycle form of development of the protozoan which produces the highly fatal smallpox?

But answer to these questions, of so great interest both practically and theoretically to man, will come, doubtless, soon, as so many like answers have come of late. Just now, we may well congratulate Drs. Councilman, McGrath, and Brinckerhoff on their long-awaited discovery and be glad that they have added one more jewel to the crown of American learning and strenuosity in the broadening field of Medicine—learned and strenuous for the service of mankind.

THE FOURTEENTH INTERNATIONAL MEDICAL CONGRESS.

THE land of the Cid and the Alhambra has been extending a cordial greeting to the conquerors of disease during the last week. It is rather interesting to consider that where it was once valiant to slay one's fellow-men, it is now noble and worthy of renown to save them. It is also interesting to think that the hands that were outstretched, half a dozen years ago, to snatch each others lives in Cuba, are now extended in social greeting; for many American physicians and their friends have availed themselves of the opportunity to visit Spain during the International Medical Congress at Madrid, and doubtless some who met on battlefields have met again wearing honorable stripes and medals, for their mutual efforts at extermination.

We dwell with far greater pleasure on that phase of civilization that calls the healers of disease together from all parts of the world, to consult how best to preserve life, than we do on that martial spirit that thirsts to take it.

And yet, the very worst evils of warfare, even of the recent Spanish-American war, add much to the general knowledge of medicine. American

physicians have profited by the "late unpleasantness," in adding to their experience an important chapter in tropical diseases and war surgery, which will save by means of preventive measures many lives that would otherwise be lost, in the oncoming tide of colonization.

We feel a little sentimental over this Congress. Paris, London and Berlin are natural business headquarters for scientific men, but the land of toreadors and cavaliers, the land of ballads and romances, the land of castles and cathedrals, of fretted stone and age-toned pictures, what has it to do with microbes and antiseptics?

And yet, the modern heroes of science have all been there, and have been fêted and honored and presented at court, and the queer world-jargon of many tongues proclaiming the new discoveries of medicine have sounded in the very halls where were once discussed the discoveries of one, Columbus, and the value of the Inquisition.

We would have given much to have been there; to have heard the echoes of past faiths and sciences in the old historic city. Our correspondents have sent us full cable reports, which we publish in detail, but our readers must call upon their imaginations to place the brilliant assembly of modern scientists in the picturesque setting of a romantic past.

ECHOES AND NEWS.

NEW YORK.

Five Years for a Midwife.—Johanna Weinz, of 154 East Ninety-second street, a midwife, was convicted last week before Justice Davis in the criminal branch of the Supreme Court of manslaughter in the first degree in having caused the death of Mrs. Mary Wenger by a criminal operation last June. She was sent to the Auburn State Prison for Women for five years. The conviction is the first of its kind for many years in this county.

Clinic by Professor Mikulicz.—Upon the invitation of Dr. Polk, Prof. Johann Mikulicz of Breslau conducted an operative clinic in Bellevue Hospital, on Monday, April 20, for the Faculty and students of the Cornell University Medical College. He had as cases a gastrostomy, an inguinal hernia, and a fibromyoma of the uterus. The gastrostomy was performed according to Witzel's method, which the professor appeared to consider the best. Upon the hernia he did an ordinary Bassini operation, and the other case was treated by myomectomy. The interesting peculiarity of his work was his great dexterity, as the gastrostomy and the hernia were done in an extremely short time. One of the surgeons present remarked that he had never seen a Bassini operation completed more quickly, although the case, to be sure, was of the acquired variety and presented no unusual difficulties. Cotton gloves were also noticeable as the professor's preference. These were changed as fast as they became blood-stained, but to the onlooker it seemed that considerable time was wasted in drawing on a clean pair each time. He remarked to the House Staff that for appendicitis operations he preferred the old-fashioned transmuscular and not intermuscular incision. In closing the abdominal wound he employed numerous layers of chromicized catgut sutures. This material was also used very freely in suturing the uterus after the myomectomy. In addition to the students of the Cornell University Medical College there were present most of the representative surgeons of the city.

Odell's "Charity" Grabs.—We quote from the New York *Sun* what "economy" means to Governor Odell in his management of the State Charities: "Another session of the legislature has come and gone, and provision under Gov. Odell's 'economy' administration has been made for the maintenance and support of the inmates of the State insane hospitals and the State charitable institutions and reformatories. The philanthropic and humane people throughout the State, who had hoped against hope since Gov. Odell assumed office that each session would witness an abandonment of the Governor's plan to hitch the administration and patronage of these institutions to his personal political machine, are more dismayed than ever at the outlook for the unfortunate wards of the State. Under the plea of economy the Governor's treatment of the State hospitals has been merciless. He has forced their appropriations to be cut down, until he at one time boasted that he had caused a saving of $1,500,000 in one year in the cost of the maintenance of these institutions. While this was shown to be greatly exaggerated, it was also clearly demonstrated that the actual reduction the Governor had caused made the appropriations for the support of these hospitals insufficient and was causing great distress to the patients. At the present time the attendants at the Gowanda and Buffalo State hospitals, who are much better fed than the patients, are on the verge of a strike because of the poor quality and the insufficient quantity of the food supplied to them. Only a few days ago the patients employed in the laundry at the Hudson River State Hospital in Poughkeepsie refused to work, because, while required to do hard labor, they had been deprived of meat at their morning meal.

"In the name of economy the Governor compelled the State Commission in Lunacy to build three-story, non-fireproof barracks for the insane at the Rochester State Hospital, in place of the safe two-story structures such as were built in this State previous to Gov. Odell's occupancy of the Executive Chamber and such as are built by progressive nations the world over.

"The medical care given to the insane has so deteriorated under Gov. Odell's administration that last year, for the first time in a decade, the recovery rate was greatly decreased from that of former years.

"The ratio of physicians to patients under this system of enforced economy has fallen within recent years from one physician to 159 patients to one physician to every 200 patients, while in other countries the ratio is one physician to every 100 or even a less number of patients.

"That this is not economy, but inhumanity masquerading in its name, is the universal opinion of the prominent men and women throughout the State who have given years of their lives to helping the State's unfortunates and who, until Gov. Odell's election, were proud of New York State's insane hospitals and charitable institutions and reformatories.

"Alleged independent newspapers of New York and Brooklyn that profess to be governed by high moral principles had no word to say in opposition to the Ramsperger bill, the progress of which through the

legislature Gov. Odell secretly favored and was familiar with, but which he finally vetoed, ostensibly because it was too bad to sign, but really because he feared it might put patronage in the hands of Platt men. The purchasing agent for the State hospitals under the Ramsperger bill was to have been a relative of Mr. Platt's leader in the State Senate, and Gov. Odell evidently realized that a Platt man as the purchasing agent for the food supplies of the State Hospitals might not look with the desired favor upon the groceries and provisions furnished by the J. W. Matthews grocery house of Newburg. Under cover of the praise of these 'independent' newspapers Gov. Odell made haste to sign an equally bad bill, that introduced by Senator McEwan empowering the Governor to control absolutely, just before each fall election, all the salary increases in the State charitable and reformatory institutions. In the annual appropriation bill passed by the recent Legislature, which is awaiting Gov. Odell's approval, the Governor caused to be inserted an increase of $85,000 in the appropriation made for the wages of the employes of the State hospitals other than the officers for the next fiscal year, beginning Oct. 1. This increase was promised to the "influential" employees in each of the ten State hospitals just before election last fall if they would round up the employees of the institutions in support of the "business Governor." Here is a direct instance of the bringing of the service into politics in the worst possible way. And under the McEwan bill, which the Governor signed on Friday, the additional $85,000 appropriated for salaries will be distributed among 'the faithful' by the Governor.

"The Governor has cut the appropriation this year for the salaries of the officers and physicians of the State hospitals to the extent of $25,000, and a proportionate falling off of the recovery rate must therefore be looked for.

"The State Commission in Lunacy told the Governor that the least amount which the commission could get along with for the next fiscal year for betterments to the State hospital institutions was $1,070,000. The bill passed the legislature, and was before the Governor, carrying this amount, but the Governor caused it to be recalled by the legislature on the last day and had the amount of the appropriation cut $200,000. The patronage connected with the officers and employees of the State hospitals may be appreciated when it is stated that for the next fiscal year they will draw $1,565,000 from the State Treasury. For the present fiscal year $2,000,000 was appropriated for food and supplies of the inmates of the State hospitals. The appropriation made by the Legislature for the next fiscal year is $2,535,000.

"Apparently this is an increased appropriation for the food of the patients, but inquiry develops the fact that about one-half of the half million increase is to pay for a deficiency in the coal appropriation for this year, caused by last winter's high prices, and that the balance of the increase is simply to meet the cost of the dietary adopted for the insane patients some months ago, when it was found that Gov. Odell's "economy" administration of the hospitals was starving the patients. That dietary is still in operation in the State hospitals and is the same one under which the attendants and patients are now striking for more and better food. The appropriation for the office of Fiscal Supervisor of State Charities, an office which was established in the interests of economy, is $30,320. The appropriation for the Bureau of Charitable Institutions of the State Comptroller's office, which the new office replaced, last year was $18,300 and the year before $17,800. The latter had ten employees, the former has fourteen, including the Fiscal Supervisor himself, at a salary of $6,000, and his secretary, at a salary of $3,000. The salary of Major George W. Hobbs, who was the head of the charitable bureau in the State Comptroller's office, was $2,500 only, and he is employed by Mr. Bender at the same salary and is the brains of the Fiscal Supervisor's office. All these things are related simply to show the practical working of the 'business Governor's' brand of 'economy,' when he makes a few places for those who can be intrusted to support his unsavory political machine, which he hopes may yet land him in the Presidential chair at Washington.

"While thus depriving the insane of proper care and food and housing, Gov. Odell forces an appropriation of $50,000 through the Legislature to pay the expenses of a glittering 'electioneering jaunt,' of which the Governor himself is to be the central figure, to attend the St. Louis Exposition."

PHILADELPHIA.

Friend's Asylum.—Dr. S. D. Ludlam of Baltimore has been appointed House Physician at the Friend's Asylum for the Insane, Frankford, to succeed the late Dr. Carncross.

Norristown Hospital Wins.—The long pending suit of the Norristown Insane Asylum against the City of Philadelphia has been decided by the Supreme Court in favor of the hospital. The suit was for $67,000 for the care of insane patients.

Scale of Telephone Charges.—It is said that the Allegheny County Medical Society has unanimously adopted a scale of prices for its members who give advice over the telephone. The charges range from $2 to $5.

Clinics by Distinguished Surgeons.—Two noted European surgeons will hold clinics at the Jefferson Hospital on May 9 and 16 at 1 P.M. On the former date Professor Hans Kehr of Halberstadt, Germany, will operate on cases of gallstone, and on the latter Professor J. von Mikulicz-Radecki of Breslau will give a clinic on carcinoma or other surgical diseases of the stomach and intestines.

State to Aid in the Suppression of Smallpox.—For the information of Boards of Health and of School Boards organized as Boards of Health for the suppression of smallpox, as to what extent and in what manner they may receive State aid in coping with this disease, Dr. Benjamin Lee, Secretary of the State Board of Health, has had printed in pamphlet form the regulations adopted by the State Board for controlling the disbursement of the special fund of $50,000 placed at its disposal to aid in this work. It sets forth that the fund shall not be used for any other purpose than for assisting local communities during the prevalence of smallpox and for meeting just and reasonable expenses incurred in the suppression of that disease. School Boards acting as Boards of Health applying for aid must furnish sworn evidence that they have organized formally, and have adopted sanitary measures and appointed a paid sanitary agent. In no instance will the State Board of Health assume the entire expense of suppressing the disease in any particular locality, and it is expressly stipulated that no unvaccinated person shall be appointed to any official position charged with carrying out preventive measures.

Hemolymph Nodes and Their Relation to Adipose Tissue.—An exceedingly interesting address, illustrated by lantern and microscopic slides, on the above subject, was delivered before the Pathological Society of Philadelphia at the annual conversational meeting, April 23, by Dr. A. S. Warthin of Ann Arbor, Mich. Dr. Warthin reviewed the various interpretations of the nature of these nodes, and gave his reasons for believing that they are organs

sui generis. He has found them in everybody that he has examined—nearly 150. They may not be seen in fresh tissue, hence it is well to fix the fat of the regions where they are commonly found in formalin, after which they may be located. The nodes are apparently constantly changing, their instability being a prominent feature. Dr. Warthin considers the finding of the so-called interscapular glands by Hatai as of great importance, as they furnish embryologic proof of the transformation of fat into hemolymph nodes.

CHICAGO.

Internes for Cook County Hospital.—The examinations for interneships in this hospital on April 17 resulted as follows: Rush Medical College secured six places; Northwestern University seven places, and the University of Illinois three places.

Phototherapy.—Dr. Frank Hugh Montgomery read a paper on this subject before a recent meeting of the Chicago Medical Society. Carefully tabulated reports of 800 cases of lupus vulgaris treated at the Finsen Light Institute in Copenhagen show the light to have been of benefit in all but two or three per cent. About 70 per cent. are reported as cured, though in about 20 per cent. the diseases returned after varying intervals. Recurrences were due chiefly to reinfection of skin from mucous membranes, which, in most situations, are not accessible to the light treatment. Recent improvements in the original apparatus have increased the power and efficacy of the light about fourfold, the number of treatments required for a given class of cases being about one-fourth the number formerly required. A smaller lamp has been designed by Professor Finsen and Dr. Reyer for the treatment of a single patient at a time, and is equally effective with the larger apparatus. The principle is the same, requiring exposure of an hour each to a single area, and the constant attention of a trained assistant. Many other lamps have been designed to render the treatment more rapid and less expensive. Some of these lamps do excellent work, on superficial lesions, but none has the penetrating power of the original Finsen apparatus, in which a larger volume of light is condensed and applied to a small area. Lamps with iron electrodes give a light, rich in ultra-violet rays which have remarkable bactericidal powers, but which do not penetrate below the epidermis. The influence of the light is due to a stimulation of cells rather than to the direct effect on bacteria. The histologic changes are practically those of simple inflammation, which is never severe enough to destroy normal connective tissue. Phototherapy is the treatment to be chosen before all others in the treatment of all tubercular lesions of the face, because it is effective, is without danger, and gives the best possible cosmetic results. It is effective, also, in some cases of lupus erythematosus, alopecia areata, rosacea, vascular nevi, superficial epitheliomata, and indolent ulcers. The red light (exclusive of actinic rays) treatment of smallpox has, in a considerable number of cases, apparently prevented suppuration, secondary fever, and pitting, and shortened the course of the disease. To be effective, the actinic rays must be absolutely and continuously excluded; the photographer's sensitized plates hung in the room with the patient should, at the end of the treatment, show no influence of white light.

Laparotomy Convalescence, with Reports of Twenty Illustrative Cases.—Dr. R. W. Hardon read a paper on this subject before the Chicago Medical Society, April 22. A large percentage of abdominal cases operated upon by the writer during the last four years have been allowed to get out of bed in from one to four days following operation, and in none have any but the best results been seen. Marked increase in the comfort of the patients in every way was noted following this line of procedure. Patients left the hospital stronger, and were sooner able to resume their occupations than had been observed to be the case when kept in bed in the recumbent posture for a much longer time. The additional comfort of the patient comes from being able to have more complete bowel movements, consequently less flatus and distress from this often troublesome feature; from the change of position and avoidance of any bed pressure symptoms; from a less nervous condition incident to keeping patients as confined as is the custom; from an absence of muscular weakness caused by an atrophy of disuse. In the cases enumerated, there are 6 of appendicitis; 2 cases of hysterectomy with abdominal incision, in one of which the bladder was opened both abdominally and vaginally; one case of hysterectomy with vaginal incision; two cases of multiple ovarian cysts, one of which also had a hysterectomy for fibroid tumors; four cases for removal of pus tubes; one case of femoral hernia, in which a portion of the bladder was excised; one case of double inguinal hernia; a case of right inguinal hernia; two cases of gall stones in the gall bladder and ducts. The ages of the patients varied from five to over sixty-five years. Some of the patients were allowed to have movements on the jar, or commode, out of bed, within twenty-four hours, and all within the first four days following operation. The author's conclusions are: (1) That early getting out of bed tends to produce greater comfort to the patient; (2) shorter stay in the hospital; (3) earlier convalescence and consequent ability to resume usual occupations; (4) less danger of adhesions; (5) less expense to patients and charity institutions; (6) practically no atrophy of muscles from disuse; (7) facilitates nursing.

GENERAL.

Plague at Mazatlan.—The plague at Mazatlan is stamped out, and its reappearance is not expected by the Government health authorities. From the beginning of the outbreak until Jan. 31 there were 165 deaths; during February, 50; March, 13; April, 2. Over three hundred houses were burned in Mazatlan alone, for which upward of about $100,000 was paid.

Economy Society Sells Out.—All the holdings of the Economites in the Sewickley valley are said to have passed into the hands of a syndicate of Pittsburgers, the price paid being $2,500,000. The senior trustee, John S. Duss, of the Harmony Society, as the organization is called, is said to have been the moving spirit in the sale, which carries with it the title of 2,600 acres of land, including the town of Economy. Only a half dozen members of the celibate society of Economites are living, and it is assumed that the sale of the land means the practical winding up of its affairs after an existence of more than one hundred years.

An Enlightened Legislature.—The principal action in the Virginia House last week was the passing of the Harvey Medical bill, which is a defeat to the Christian Scientists and puts them out of the pale of the law. This bill compels all persons practising medicine or the art of healing in this State to stand an examination before the State Board of Medical Examiners, who grant all licenses to practice. As none of the "Christian Science doctors" are trained physicians, this provision virtually bars them from practising their profession in this State. The Christian Scientists and their friends have fought the measure with all the means at their command. One

prominent lady "Scientist" declared publicly that she would continue to practice the healing art, law or no law, and would go to jail if necessary to show her defiance of the measure.

Smallpox Etiology.—The Philadelphia *Press* is quoted as saying: "'If Prof. Councilman, the distinguished pathologist of Harvard Medical School, can prove that the germ of smallpox is a protozoan —the lowest form of animal organism,' said Dr. William M. Welch, physician-in-chief of the Municipal Hospital, yesterday relative to a dispatch printed in the *Press*, announcing such a discovery, 'then he has done something for which scientists will honor him.'"

Joint Research in Physiological Chemistry.—Dr. Arthur Gamgee, fellow of the Royal Society of England, the distinguished emeritus professor of physiology in Owens College, Victoria University, England, last week began at the Johns Hopkins Medical School his consultation with Dr. Walter Jones, associate professor of physiological chemistry in the Johns Hopkins University. Dr. Gamgee had come to the United States mainly for this purpose. As a result of joint work done by Drs. Gamgee and Jones on the occasion of the former's previous visit, a most interesting chemical relation was discovered between the nucleins and the nucleo-proteids, which has suggested a very fruitful field for future research, and the two scientists are now preparing to apply to its solution the physical methods of the polariscope to disclose relations hitherto hidden from students of chemistry. Dr. Gamgee will remain in Baltimore a few days to outline a plan of individual work for himself and Dr. Jones, and he will then leave for Europe. Both will thereafter carry on their labors in conjunction, though on different sides of the Atlantic. Dr. Gamgee, who is a leading authority on hemoglobin, some time ago made, as one of his chief investigations, a photographic study of the spectrum of hemoglobin and its derivatives. Drs. Gamgee and Jones are undertaking the investigation of five compound proteids belonging to the group of nucleo-proteids known to be the constituents of the nuclei of cells. These were found also to be dextro-rotatory, so that, contrary to the traditional belief that all proteids are levorotatory in character, at least five substances (and perhaps more) intimately connected with the life process were shown to be dextrorotatory.

Tuberculosis in Baltimore.—Methods of dealing with and preventing the spread of tuberculosis were discussed at a meeting held last Friday in Baltimore. The meeting was designed to have an educational influence on the community at large. Dr. William Osler and Dr. Henry Barton Jacobs composed the committee. Dr. Herman M. Biggs of New York told what is being done to check the spread of consumption in that city, and Health Commissioner James Bosley spoke of the local problem. The subject will also be discussed by Dr. William H. Welch, president of the State Board of Health, and Dr. John S. Fulton, secretary of that body, and by Dr. William S. Thayer, president of the tuberculosis commission.

Prize of $1,000 for Dr. Sabin.—Dr. Florence R. Sabin, assistant in anatomy at the Johns Hopkins University Medical School, has been awarded the prize of $1,000 offered two years ago by the association formed for promoting scientific research by women. The association met at Smith College on April 18 and the award was decided on by 12 professors, representing the biological, chemical and physical sciences. Dr. Sabin was in competition with 10 others. She presented the results of an investigation on the origin of the lymphatic system, embodying a discovery of far-reaching importance. Dr. Sabin is a graduate of Smith College and took the degree of M.D. at the Johns Hopkins. She is the first woman to be appointed an instructor at the medical school. She held the woman's fellowship in anatomy there in 1901. Recently she declined an offer of the professorship of anatomy at the Woman's Medical College, of London, preferring to continue her work at Johns Hopkins.

Sanitation and Better Dwellings.—At a recent meeting of the American Institute of Social Service Mr. Robert Garrett was appointed a member of the American committee which is to cooperate with the sociological workers of other countries in the International Housing Congress, to be held in Paris, from July to November next, at the Grand Palace in the Champs Elysées. The congress is to take place under the patronage of the French Government, with a special regard to the importance of inaugurating preventive measures against the spread of tuberculosis and alcoholism. The chief work of the American committee will be the preparation of an exhibit of data as to what has been done to solve the housing problem in this country, with copies of laws passed in various States, models of improved tenements, etc. Richard Watson Gilder, of New York, editor of the "Century," is the chairman of the committee, and the other members are Albert Shaw, New York; Carroll D. Wright, Washington; Stanley McCormick, Chicago; Robert Garrett, Baltimore; Talcott Williams, Philadelphia; M. E. Ingalls, Cincinnati; William B. Howland, Dr. E. R. L. Gould and J. H. Hyde, New York. The official announcement of the congress says among other things:

"The two great diseases that menace the future lives of the race—tuberculosis and alcoholism—have their origin for the most part in the unhealthy and pitiable lodgings of the workingmen.

"This question of improved dwellings touches all problems that concern the comfort and the hygiene of cities—cleanliness, sanitation, purity of water supply, systems of drainage, facilities of traffic. It is not merely a few citizens who are demanding such reforms; the public generally see their need. We are living according to past traditions—imperfect and inadequate for our times. While this order of things continues, little can be accomplished.

"What is now needed to advance this question of housing is a practical demonstration. This exhibition will be aided by some of the most prominent men of the day, and the exhibits will be most important in arousing public interest in the amelioration of the condition of the workingman and the general well-being."

Stammering.—M. Chervin has studied the whole subject of stammering and allied affections in a stout volume of 550 pages lately printed in Paris. His statistics are curious. As stammering is a cause of exemption from military service it is possible to determine its frequency in different nations. It appears that of 1,000 conscripts examined, the number rejected is as follows:

	Per 1,000.
France	7.50
Switzerland	3.23
England	2.87
Austria-Hungary	2.2
Belgium	2.1
Italy	0.86
Russia	0.19

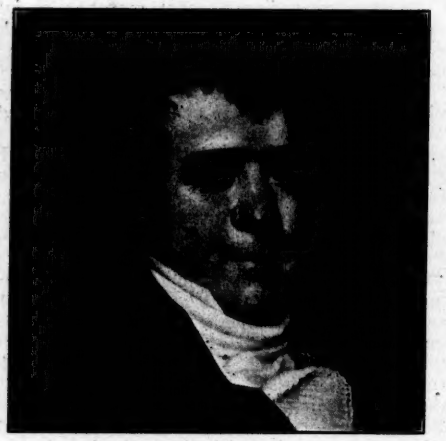
Comparing these numbers with those that represent the frequency of nervous affections, he finds that in France the nervous affections are exactly twice as numerous as the cases of stammering; in Belgium they are four times more numerous, in Italy seven times, in Switzerland eight times, and in Russia thirteen times. No statistics of stammerers in the United States are given, but it would seem that the number per 1,000 must be very small, while the number of nervous affections would probably be considerable.

Obituary.—Dr. Franklin A. Sherman died April 22, aged seventy-four years. He was born in Castleton, Vt., and was a grandson of Dr. John Woodward, a famous physician in that town in the early years of the last century. Dr. Sherman was a cousin of the late Rear-Admiral John Woodward Philip, and of Commander Edwin T. Woodward, retired, of the United States Navy.

SPECIAL ARTICLE.

EXCURSIONS IN OLD NEW YORK MEDICINE.—III.

THROUGH the kindness of Dr. H. S. Stearns, a great-grandson of the first President of the New York Academy of Medicine, whose attention was called by our article in the last Excursions in Old New York Medicine to the lack in our published medical records of any portrait of this grand old man of New York Medicine, we are enabled to present to our readers the first portrait of Dr. John Stearns ever published. It is taken from a photographic copy of an oil painting in the possession of his grandson, and is said, by those who knew the man, to be a much better likeness of him than the oil painting at the Academy of Medicine.



DR. JOHN STEARNS.

The best tribute to Dr. Stearns is that of his personal friend, Dr. Francis, one of his successors as President of the New York Academy of Medicine, in his address on Old New York (published by Widdleton, N. Y., 1866), which contains so much that is of interest in the medical history of those times. Dr. Francis said:

"Like the Historical Society, the Academy of Medicine selected at its organization a venerable head as its first president, John Stearns. He had fulness of years, weight of character, and corresponding experience, and could look back with satisfaction on an extensive career of professional service. He was a native of Massachusetts and born in 1770. He was graduated in the arts at Yale College, in 1786. He attended the lectures of Rush, Shippen, Kuhn, and others of Philadelphia, but did not receive the doctorate until 1812, when the Regents of the University of New York conferred on him the honorary degree of M.D. He commenced the practical exercise of his profession at Waterford, afterward at Albany and at Saratoga, and finally settled in the City of New York, where he maintained the reputation of an honorable, devoted, and benevolent physician until the close of his long life in March, 1848. His death, which was greatly lamented, was occasioned by a dissection wound, arising from his zeal to arrive, by a post-mortem examination, at more certain pathological conclusions, in a case of singular interest. He met this unexpected disaster with exemplary forbearance, and experienced the consolation of a Christian's hope in his final departure. The Academy paid appropriate funeral honors to his memory, and the Rev. Dr. Tyng, of St. George's Chapel, of which Dr. Stearns had long been a member, delivered an appropriate discourse on the life and character of the "Good Physician."

Great as was the devotion paid by Dr. Stearns to practical medicine, he was in earlier life enlisted in political affairs; and we find him in the Senate of the State of New York in 1812, and a member of the Council of Appointment. Shortly after the organization of the State Medical Society, he delivered the annual address as President. He was for many years a trustee of the College of Physicians and Surgeons. His name is recorded as one of the founders of the American Tract Society, and he took a deep interest in the welfare of the Bible Society, and the institutions for the benefit of the Deaf and Dumb. The annals of charity include his name in other institutions of a benevolent design. His philanthropic spirit can not be questioned. His writings on the profession, and on subjects of a kindred nature, are scattered through the periodicals of the times. He is indissolubly associated with an heroic article of the materia medica, the virtues of which his clinical sagacity first brought to notice. His brief paper on Catalepsy attracted the attention of the learned Dr. Good. This short sketch must suffice to show that the Academy were judicious in the choice of their first officer, and both his inaugural address and the manner in which he fulfilled his trust, soon dismissed all doubt as to the wisdom of their suffrage. This venerable man gave dignity to the meetings; his courteousness secured deference and maintained authority; his knowledge and impartiality added fairness to debate, and increased the gratification of intellectual association."

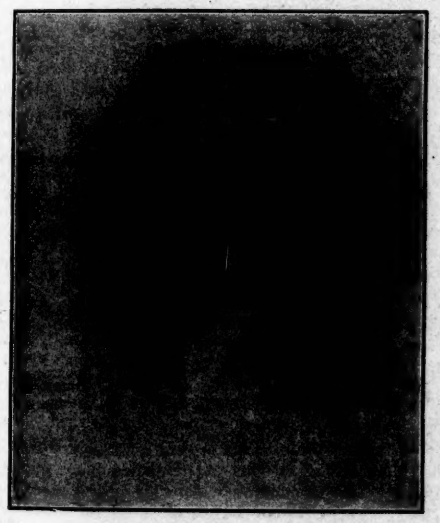
DR. ISAAC WOOD AND DISSECTION MATERIAL IN THE EARLY DAYS.

Dr. Isaac Wood, who was the fourth president of the Academy, elected in 1850, when the presidential term was for a year, and then in 1853, elected for a second time, the first president of the Academy to be given the honor of reelection. Dr. Wood was known especially for his interest in medical societies, and for the time he devoted to charitable organizations of various kinds. He was one of the most prominent founders of the Society for the Relief of the Widows and Orphans of Medical Men. He was its energetic secretary, and subsequently its president.

When the cholera broke out in New York in 1832, Dr. Wood, who had foreseen its arrival, predicted its ravages at Bellevue Hospital. In confirmation of his apprehension, out of 2,000 patients, prisoners and maniacs, 600 died. It was not long before Dr. Wood himself fell ill of the disease. Forty bodies lay in the dead

house at one time, the undertakers not being able to make coffins fast enough to bury them as they died, and in one instance the dead and the sick lay in the same bed. On not a few occasions Dr. Wood, while going through the wards was obliged to step over the dead and the dying, who were lying in rows on the floor, the nurses not having time to prepare beds, as the patients were taken so suddenly. As a result of the effects of the cholera upon his constitution, Dr. Wood was not himself for some five years afterward. For nearly ten years before his resignation as visiting surgeon to the institution he had done practically all the operations at Bellevue.

Dr. Wood's faithful application to his varied professional duties, later in life, are only a continuance of the habits acquired as a medical student. He is a striking example of the work accomplished by the medical men of his generation, who in spite of drawbacks of many kinds and lack of opportunities, to say nothing of positive discouragement, succeeded in raising the



DR. ISAAC WOOD.*

standard of medical study, inspired others with their own enthusiasm for professional progress and thought nothing too much that promised to be helpful for the development of American Medicine, whose brilliant future he seems to have foreseen, even in those trying times. If there was any truth in the popular impression that long-continued hard work shortened life we should expect to find many of his contemporaries among the geniuses prematurely carried off, while on the contrary, most of the great men lived to be long past the psalmist's limit, some of them, like Dr. Wood himself, living in the enjoyment of good health beyond their seventy-fifth year.

It sounds almost like a story of the student life of medieval times to hear of the eagerness with which Dr. Wood, in his medical student days, improved every opportunity to gather anatomical knowledge. In order to have the opportunity to see completely every dissection, he would not infrequently go day after day from dinner to dinner, 24 hours without food. "Often did he scale," says Dr. Francis, "the hospital gate at four in the winter morning, to study with his colleague, Dr. J. C. Bliss, until sufficient light permitted him to attend and prescribe for the patients, after which he went to breakfast."

Like a number of the other New York men of the early days, Dr. Wood graduated under the authority of and received his diploma of Doctor in Medicine from Queens, now called Rutgers College, of New Brunswick, N. J. In the early part of the century the New York medical institutions had not the authority to grant medical diplomas. This seems all the more curious to us now, when New Jersey is one of the few, especially of the Eastern States, that has no medical colleges, the State laws providing no legal method, we believe, for obtaining dissecting material.

Dr. Samuel W. Francis, in his biographical sketches of distinguished living New York physicians (published by George P. Putnam & Son, New York, 1867), gives some account of Dr. Wood's experiences in the obtaining of material for dissection purposes in the first quarter of the century. It might readily be anticipated that such experiences would shorten life. Yet, as we have seen, Dr. Wood lived on to pass the three-quarter century mark. Dr. Wood told a friend that he had often been obliged to cross rivers, travel for miles and when night clouded vision, dig up the body of some poor creature, when the weather was so cold that his companion, who was on the lookout, had to run up and down to prevent freezing. And even then, when the body was secured, the grave covered up and smoothed over and the dead man placed in a wagon, wrapped in a cloak and sitting by his side, like some pale traveler, his friend must leave him, for neighbors were on the scent and he had to drive some twelve miles with a coroner's jury theoretically by his side and a verdict of "guilty" staring him in the face. Should the horse fall, or some obstacle arrest his progress, or should he grow sick, all would be over. On one occasion, in this city, he went out with two other students, and having obtained a body from Potter's Field, tied its hands and feet together and fastening it (a small subject) around his neck so as to be suspended in front, threw a large cloak or mackintosh over all, and walked down Broadway at night, locking arms with his two friends and passing within three yards of the night watchman, who looked upon them and their singing as gay and festive youths returning from a carousal.

This matter of providing sufficient dissecting material for teaching purposes constituted one of the greatest stumbling blocks to the proper training of medical students in the early part of the nineteenth century. Some of the stories of adventure in the quest of bodies, undertaken by men who were later to be the leaders of the profession here in New York, show how many risks were taken by our ancestors in medicine for the purpose of teaching properly and satisfying their own thirst for exact scientific knowledge as far as it was possible. There is no chapter of medical history that reflects more credit upon the medical men of that time than these stories of body-snatching, that we cannot read even at this distance of time without an eerie feeling of repugnance. Not a few embryo presidents of the New York Academy of Medicine risked their reputations in the community, exposed themselves to the dangers of infectious diseases (much less understood then than now and consequently more blindly and unreasonably feared) stood cold and fatigue and loss of sleep, to say nothing of the unsavory character of their work and often of the companions they had to employ and sometimes even incurred the danger of fatal injuries from infuriated mobs in order to obtain dissecting material for teaching and personal study and investigation.

*We are indebted to Mr. Arnold Wood, of the firm of Wm. Wood & Co., Medical Publishers, for the plate of this portrait. It is a copy of an old daguerreotype, which is said to be the only portrait of Dr. Wood extant.

Nothing in the careers of these noble men of science shows more clearly the indomitable character of their enthusiasm for right teaching and their insatiable desire for exact information. Some of the sacrifices made in this way are worthy to be matters of record for all time, as an example to future generations of physicians of the difficulties encountered by our predecessors and the way they were overcome. It was almost as dangerous to be known as a dissector in New York City in the early part of the nineteenth century as it was in old Athens and Rome in Aristotle and Galen's times.

CORRESPONDENCE.

TRANSACTIONS OF FOREIGN SOCIETIES.

German.

LEUCOCYTOSIS IN ACUTE DISEASES—RESULTS OF PARADOXICAL EMBOLISM—VALUE OF ADRENALIN IN SURGERY, ESPECIALLY FOR LOCAL ANESTHESIA.

Herr FRANKE, at the Dresden Society for Natural Science and Medicine, Jan. 24, presented a paper on the subject of Leucocytosis in Acute Diseases. The author stated in order to corroborate the observations which Curschmann presented to the medical world in 1901 concerning the significance of leucocytosis during appendicitis, he had himself collected the following data from the patients in the Surgical Division of the City Hospital. Among 24 typical cases, marked increase in the leucycotosis totally failed in only four. In three of these four the attack of appendicitis disappeared entirely without any surgical interference. In the fourth an operation was finally performed because there were persistent threatening symptoms, but it disclosed no collection of pus. In eight of the patients there was a distinctly marked increase in the number of leucocytes, even up to between 15,000 and 22,000, but this observation was only a passing incident. These patients, likewise, were cured without operation. The variation in the leucocytosis is to be explained by the facts either that there was no pus-formation whatever, or that it rapidly evacuated spontaneously. Of the remaining 13 patients 11 had large abscess-formations. Nine of these had absolutely frank leucocytosis, whereas in the other two this symptom failed. The author, therefore, comes, on account of these observations, to the following conclusions, which, on the whole, agree with those of Curschmann already alluded to. Appendicitis runs its course in a very small minority without any leucocytosis whatever. Should leucocytosis occur, however, and especially should it persist at the later period of the disease, the probabilities are all in favor of the presence of an abscess at that time, although at the same moment the other symptoms of abscess-formation may be totally wanting. Consequently, the value of the blood-count during this disease is very high. After describing the details of his method of taking the blood-count in this disease, the author briefly stated his results in twelve observations on leucocytosis during typhoid fever. In ten of these persons the leucopenia was developed. In three, only 1792, 2360 and 2500 leucocytes were found, respectively. He also referred to the fact that leucopenia is recognized now by many authors as one of the signs of this disease.

Herr SIMMONDS, at the Biological Section of the Physicians' Society at Hamburg, Jan. 20, 1903, presented a paper on the Results of Paradoxical Embolism. He stated that occasionally during autopsies on cases of various primary diseases and neoplasm-formations in the course of the general circulation as distinguished from the pulmonary circulation, one comes upon emboli in the general circulation, without there being any signs that the lesser or pulmonary circulation has been affected. Naturally, the observer then asks how it was possible for so large a particle to pass up the vena cava into the right heart, to make from this point the circuit in the lungs, to reach the left heart and then pass through the aorta to its point of lodging. Cohnheim was the first to call these crossed or paradoxical emboli, and to point out the possibility of their passing through an open foramen ovale, which it must be remembered, occasionally remains patent, and would therefore make a direct passage from the right auricle into the left auricle. After him, authorities like Klebs, Vonome, Marchand, Lipps, Zahn, Hauser, Schoull, and others reported cases which proved the correctness of this supposition. In a similar manner Simmonds presented the following preparation as proving this contention: An old woman died of embolism of the lungs a short time after a herniotomy. The main trunk of the pulmonary artery was entirely filled with a convoluted clot; another clot about 17 c.c. long still lay in the right heart, and one branch of it extended into the inferior vena cava, while another branch of it passed up into the region of the foramen ovale, and had become fixed there. When the left auricle was opened it was found that this branch of the clot extended through the septum, into the left auricle, and hence there was observed a well developed penetration of the clot from the right into the left auricle, and in this manner proved beautifully the paradoxical embolism theory. The author observed that the clot had not penetrated through the foramen ovale itself, but through one of the small secondary openings which usually pass between the two auricles.

Herr BRAUN, at the Medical Society in Leipzig, Jan. 30, 1903, presented a paper on the Value of Adrenalin in Surgery, especially for Local Anesthesia. The speaker began by reference to various experiments upon animals, whose value he briefly stated in the following terms: If any local anesthetic like cocaine is injected into tissues whose vitality has been diminished by decrease in the quantity of blood flowing through them, for instance, by means of ligation of the extremities, or cold locally applied, or adrenalin, the intensity of duration of the local anesthesia is very greatly increased over what they are when the undiminished blood-current is flowing. This phenomenon depends upon the following factors: (1) Decreased absorption by the blood at the time of its application. In other words, it remains in situ much longer, and is absorbed much more slowly, and has, therefore, the opportunity of continuing its activity. (2) All those influences which the body brings to bear resist the invasion of foreign material, and to return the tissues to their normal state are temporarily interfered with. With the increase in the local result of the cocainization there is also a decrease in its toxicity; first, because the poison is taken more slowly into the system, and, secondly, because relatively less cocaine is really required to bring about the same degree of anesthetization. The author then spoke of the pharmaceutic and therapeutic relations of adrenalin and likewise its physiological action in the body as a means of stimulating the heart, increasing contraction of the uterus, and stopping hemorrhage, and as a substitute for the older Esmarch method of controlling hemorrhage locally. He stated that a 0.1 of 1 per cent. solution of adrenalin chloride, as sold by Parke, Davis & Co., is permanent if protected from air and light, and may be sterilized by boiling. His tests show that in healthy human beings solutions as feeble as 1 in 100,000 will produce a marked decrease in the amount of blood in the tissues. If it is introduced after Schleich's method of infiltration the drug produces no damage whatever to the tissues, and even when used pure, does not cause local anesthesia. No special idiocrasy has been observed in healthy per-

sons after giving 0.5 c.c. of 1 in 1,000 solution or 10 c.c. of 1 in 10,000 solution. In patients a concentration of 1 in 10,000 and a dose of 0.5 c.c. of a 1 in 10,000 was not exceeded; consequently no unfavorable results were ever seen. If to cocaine or to eucaine adrenalin is added, an enormous increase in the local anesthesia is at once observed. Weak solutions of cocaine extend with its aid their anesthesia over a much larger area, and for a longer time than they do alone. A series of experiments in animals indicated that the systemic toxic effect of cocaine is much decreased by administering adrenalin at the same time. Tropacocaine deprived adrenalin of its power of constricting vessels, and therefore should not be mixed with it. Since October, 1902, Braun has been using cocaine and adrenalin in 150 cases, as follows, for local anesthesia: He keeps a 1 in 1,000 adrenalin solution in a sterilized brown glass bottle with a dropper attached, and adds it to the cocaine according to indications at the time it is needed. If an intense degree of cocainization is needed, three drops of the adrenalin solution are added to the 1-per-cent. cocaine solution, resulting in a practically 1 in 10,000 solution of the adrenalin. If it is desired to use a 0.1 to 0.2 per cent. cocaine solution for the infiltration anesthesia, after the manner of Schleich, 10 c.c. of the cocaine are taken and three drops of the adrenalin solution added, resulting in a 1 in 100,000 adrenalin solution. More than 15 drops of the 1 in 1,000 adrenalin solution should not, as a rule, be put into the tissues at one time, and as a rule the strength of the adrenalin solution should not exceed 1 in 10,000. One point which he observes in common in all his patients is that this mixture makes the anesthesia persist nearly an hour, thereby making the duration of cocaine anesthesia alone, without the adrenalin added seem unusually short. This mixture was applied first to the extraction of teeth and found to excel all other local anesthetics. It was applied by injecting 0.5 c.c. into the gums in front and about the teeth, as high up as the root, making the gum over a considerable area white and without sensation after a few seconds. After a delay of five or ten minutes, the tooth may be extracted, irrespective of its condition, without causing pain, provided, of course, that a well-ordered injection was made. Patients whose eyes were covered knew of the operation only when shown the tooth, and felt the cavity with the tongue. Bleeding from the cavity is almost nil, and secondary hemorrhage was not observed. A few failures were noted with the molar teeth, in cases where a proper injection could not be carried out, because the alveolar process overhung the mouth-cavity too much. Injected around a boil or abscess the following solution was found to work admirably: 0.2 to 0.5 per cent. of cocaine in 1 to 10,000 or 1 to 100,000 adrenalin according to the amount to be injected, was found to make an admirable anesthetic for operation, after waiting five or ten minutes. Bleeding also was not observed. Such a boil may be in this manner opened without a single drop of blood being lost. One injection made into the face, at the angle of the jaw, subcutaneously, produced anesthesia of the same side, which lasted three hours. A very active result was observed with the mixture when injected over the course of nerve trunks. An obliquely placed anesthesia of the finger resulted when, at the base of the finger, 1 c.c. of the 1 to 1.5 per cent. cocaine and adrenalin solution was injected, and a pronounced anemia of the finger occurred; bleeding, even here, was very little. Occasionally the absence of blood in the finger is as marked as when a rubber tube is tied about the base of it. Lermoyez has fancifully called adrenalin the alkaloid of Esmarch's bloodless method. Not only may the nerve trunks within the subcutaneous facia be affected, but also those that lie still more deeply. The manner of proceeding previously for this purpose was, by persistent, disagreeable bandaging of the arm or leg, but such is no longer necessary. By the introduction of a 0.5 to 1-per-cent. cocaine solution, with the addition of adrenalin, the median, ulnar and other similar nerves may readily be anesthetized; other nerves are the peroneus profundus, and super-facialis, the crural and the tibial; likewise the peroneus and the saphenous at the knee. For the complete interruption of sensation along these nerves, 20 to 30 minutes must pass before beginning the operation, but once established, anesthesia lasts from two to five hours. This procedure affects only the sensation. The ligature of the limb must be done in addition, to provide for the bloodless operation. The typical Schleich instillation method of local anesthesia is very much increased in duration by the use of a 1 in 100,000 solution of cocaine. In the Schleich method, the important nerves should continue to conduct sensation, but with this adrenalin cocaine mixture they become totally anesthetized, provided the operator delays about 20 minutes. The individual infiltration of the skin becomes then unnecessary in many of these operations, because the whole field is thoroughly anesthetized by waiting. For the sole purpose of hemostasis the author has had no opportunity of making observations with adrenalin, but he is convinced that, arguing from the results he has obtained as aforesaid, an absolute cessation of capillary hemorrhage may be obtained by its use. It seems to him safest of all to use in the subcutaneous tissue by injection some time before the operation has begun, and especially in bleeding in cases of hemophilia.

April 28, 1903.

Editor of the MEDICAL NEWS:

SIR: I beg to say that because of certain misunderstandings as to what is ethically right and proper in the management and distribution of the cards of an intended worthy charity, now being organized by Rev. Dr. Daniel D. Lorenz, of this city (and which errors are not that gentleman's fault), I deem it best to withdraw the use of my name from this scheme for the betterment of certain poor employes of the larger stores of this city. I retain, however, the kindliest of feelings toward that estimable gentleman, Rev. Dr. Lorenz.

Respectfully,

ROBERT H. M. DAWBARN.

105 West Seventy-fourth Street New York.

SOCIETY PROCEEDINGS.

FOURTEENTH INTERNATIONAL MEDICAL CONGRESS.

Held in Madrid, Spain, April 23 to 30, 1903.

[Specially Reported by Cable for the MEDICAL NEWS.]

The Fourteenth International Congress of Spain opened on Wednesday, April 23. The attendance was very large, there being, according to Secretary Caro, over 7,000 members in Madrid. More than half of these were foreigners. In point of numbers, the representatives from the United States stood seventh, some 200 being present. There was much difficulty in getting to the congress by reason of the lack of transportation facilities, and the organization of the different sections was not as complete as might have been wished. The Association rooms set apart for the meetings of the different sections were entirely inadequate for the purpose and, as a consequence, there was much delay and discontent.

FIRST DAY.

President's Address.—In the afternoon of the first day President Calleja, gave an inaugural address in the

Opera House, the King and Queen of Spain being present. President Calleja chose as the subject of his address a biological topic. He dwelt upon the cell doctrine of epigenesis and the influence that it had on the study of varous theoretical and practical biological phenomena. In the field of medicine he dwelt particularly on the subject of bacteriology, saying that during the past thirty or forty years the researches in this line had practically dominated the entire field of medicine.

Following the President's address, Professor Schroetter, of Vienna, Brouardel, of Paris, and Pavy made congratulatory addresses, in which they referred to the splendid attendance at the Congress. At the end of the first day Professor Silvella closed the general congress with an address, and in the evening a grand ball and reception was held in which most of the members participated.

Social Functions.—Wednesday afternoon there was a reception tendered to the members of the Congress in the Royal Gardens and on Friday afternoon there was a gorgeous afternoon reception in the King's palace, in which the King himself received the members of the Congress. Saturday afternoon there was an expedition to the Escurial. On Sunday the members attended a bull-fight and on Monday there was an excursion to Toledo.

SECOND DAY.—APRIL 24, 1903.

This day was largely given up to organization elections, and the general reports which were to have been read were postponed. Some of the work of the Sections was begun on this day and we here give in abstract a number of the papers read before the different Sections.

SECTION ON PATHOLOGY.

Treatment of the Auto-intoxications Due to Overaction of the Nervous System.—Prof. Alexander de Poehl, of St. Petersburg, traced a circulus vitiosus in nervous auto-intoxications, in which the chief agent is the adrenal. Deficient tissue oxidation sets free a number of organic acids in the blood. Adrenal, which Poehl has found in many tissues, is dissolved out by the hyperacid blood serum, and as a reducing agent, still further intensifies the acidification of the blood. Senator has recommended spermin for this condition, inasmuch as it best combats the hyperacidemia.

Cryogenine.—Professors Lumiere and Chaumier read a paper on this new antipyretic tablet. It is a product of electrolytic acton, beng a semicarbazide and in doses of from one-half to three-quarters of a gram (7 to 10 grains), it acts as a powerful antipyretic lowering temperature from one to three degrees immediately. The maximum effect is reached in about three hours and persists from six to 48 hours according to the particular type of disease under consideration. It causes no disturbance of the body, affecting neither the genito-urinary organs, stomach or intestines, nor the nervous system. Moreover, it is not poisonous to children, nor is there a toleration established.

Etiology of Malignant Tumors.—In the pathological section the discussion on the etiology of the malignant tumors was spirited and illuminating. Those in favor of the parasitic theory were equally divided with those who believed in other factors. Among the papers read a number are here given.

Tumor Formation.—Professor Doyén of Paris, gave an extensive discussion on a new micrococcus, the *Micrococcus neoformans*, which he thought was an active biological factor in the development of tumors. All tumors he thought were due to some form of parasitic infection, analogous in some manner to the inflammatory growths induced by *Actinomycosis bovis*. The malignant neoplasms of rapid growth he believes are due to the *Micrococcus neoformans*, which micro-organism he was able to obtain in pure cultures, and further, by means of inoculations in animals from the bouillon cultures he was able to produce a marked inflammatory reaction with the production of a neoplasm. Toxins were obtained from the cultures. These, on injection into individuals suffering from carcinoma produced a reaction analogous to the tuberculin reaction in consumptives. This reaction test Doyen considered of much importance.

Sarcoma and Coccidia.—Ramon y Cajal of Madrid, professor of pathology and the well-known investigator on the anatomy of the nervous system described a type of sarcoma in which he had found a coccidial parasite. This *Coccidium* caused a granuloma of central origin, which was chronic in its course and induced a central necrosis which involved the skin, muscles and many of the organs. The coccidia were large. The stages of evolution were not determined in all their various cycles, but he gave the name *Coccideus giganteus* to the organism.

Parasitism in Tumors.—Dr. O. Israel of Berlin read a critique of modern theories of parasitism in tumors. He said that tumors represented simply the reaction of the tissues to an unnatural stimulus, hence it was entirely gratuitous to suppose a uniform etiological factor. The tissues might react in exactly the same fashion, producing sarcoma, or carcinoma, etc., to very different stimuli. But, if ectogenous parasitic agents are the actual causative factors, then the demonstration of them must conform to the requirements formulated by Koch. His first requirement, namely inoculation, has been complied with only apparently, by means of the transplantation of tumor tissue; reproduction of the agens morbi has never been proven. His second requirement, the microscopic detection of the agens morbi in the diseased tissue has also not been satisfied. Israel stated that plant parasites occasionally occurred but as commensals, rather than in the rôle of the causative agents. The animal parasites so often described are artefacts. The third requirement, of pure cultures, has never been satisfied in case of the supposed protozoan agents. Finally, the production of neoplasms by the inoculation of cultures has never succeeded; apparent successes were in reality inflammatory neoplasms. The real explanation of tumors is to be sought in cytobiological conditions—a pathological increase in the proliferative tendencies of the cell.

Blastomycetic Lesions.—Dr. A. Buschke presented a very detailed review of our knowledge upon the *Blastomycetes* in disease, paying especial attention to the *Oidiummycosis* of the Americans. The routes of infection are the skin and mucosæ, probably through some lesion; the mode has never been ascertained. There are three types: blastomycetic septicemia, localized infection, and the typical non-inflammatory, slowly growing, blastomycosis. He described the various modification of the latter type in detail, with their pathology. The disease is more fatal in men than in animals, by reason of the greater tendency to internal metastases.

Artificial Imitation of Pathological Cell Conditions.—Dr. Unna of Hamburg showed that the various types of cytoplastic and karyoplastic degeneration might be induced on the microscopic slide by means of the action of various solutions.

Value of Agglutination.—Professor Paltauf, of Vienna, emphasizes the extreme value of agglutination for the determination of the specificity of any given micro-organism. The serum of horses, immunized by streptococci of scarlatina, as determined by Moser, of Berlin, agglutinated the same coccus in high dilution,

but did not show a specific reaction to the micro-organism of erysipelas or phlegmon.

Bone Implantation.—Professor Cornil of Paris read a paper, saying that the research of Bartels demonstrated that both dead and living pieces of bone were not equally efficacious in bone implantation and it was premature to infer that the living pieces kept alive. Both implantations were observed and were replaced by fresh bony tissue, but the live pieces were of more value in closing up bony cavities because the granulations were more active and abundant. This Bartels had demonstrated on the cranial bone of the dog and other animals.

The Protective Rôle of Human Saliva.—Dr. Miller of Berlin expatiated on the relations of the saliva to dental caries and the other infectious diseases of the mouth. He found that the saliva of men, per se, possessed absolutely no protective or antiseptic properties. The sulphocyanide of potassium, likewise, has no bactericidal action, nor has the buccal mucosa. The saliva contains no cytoses and is not hemolytic. The secret of the antisepsis of the buccal cavity lies in the buccal flora. By simple overgrowth, they crowd out and eliminate the majority of saprophytes and pathogenic bacteria. In the diseases of the soft parts, phagocytosis plays an important rôle. Caries is very largely predetermined by the character of the teeth.

The Etiology of Rheumatic Fever.—F. J. Poynton, M. D. and Alexander Paine, M. D., of London, presented a fresh contribution to the vexed problem of the bacterial origin or rheumatism. A priori, they pointed to the clinical evidence in favor of the specificity of the disease. Granted that it was a special disease, it was clear that it was one of a group of closely allied conditions, and on this account the postulates of Koch should be rigorously satisfied before any bacterium could be claimed as its cause. They had isolated a diplococcus from 22 cases of rheumatic fever, had demonstrated it in the principal lesions, had given it in pure culture, and produced by intravenous inoculation into rabbits identical lesions, from which they had in turn isolated the bacterium. Thus, they had gone further than all previous investigators in this field.

The organism is a minute diplococcus, aerobic or anaerobic, growing in acid milk and bouillon, and on blood agar, and of low but constant virulence. They knew of no specific test for the diplococcus.

The Influence of the Toxins of Diphtheria and of Tetanus on the Blood.—Dr. H. Kucharzewski detailed the results of a laborious experimental research into the effect of subcutaneous doses of various sizes of the toxins of diphtheria and tetanus, as revealed by changes in the corpuscles, the hemoglobin, and the specific gravity of the blood. In general, the results were the same for both. Large and medium doses diminish the erythrocytes and the quantity of hemoglobin, and increase the specific gravity. There is a polynuclear hyperleucocytosis which is at its acme in the agony, but gradually declines in the non-fatal cases (small doses). In the fatal cases there is a diminution both of the lymphocytes and eosinophiles, while the latter are increased in non-fatal cases.

The examination of the blood in infective diseases may thus give valuable prognostic indications, depending on the relative increase (favorable), or decrease (unfavorable) of the eosinophiles.

SECTION ON THERAPEUTICS.

Effects of Injections of Antidiphtheritic Serum, Antitetanic, and Antistreptococcus Serum, on the Blood.—Dr. H. Kucharzewski of Warsaw read a paper on the effects of the subcutaneous injection of these various substances, and also of normal serum taken from a horse, into rabbits. He found that these various sera produced exactly the same results when injected in various quantities as did corresponding quantities of normal serum of the horse. Hence, he concluded that the effects were due to the serum, and not to the specific antitoxic content. In detail, small doses are without any effect. Moderate doses produce a slight hyperleucocytosis for two to three days. Massive doses slightly diminish the number of red corpuscles and the hemoglobin, do not affect the specific gravity, and produce a considerable increase of the polynuclear, and diminution of the mononuclear, leucocytes.

Ferruginous Waters for Chlorosis.—Dr. E. Guilleaume, of Spa, said that the same circulatory conditions which give the subjective symptoms of chlorosis prevent the proper assimilation of iron as a medicine. The ferruginous baths (carbonic acid gas) rapidly improve the general condition by improving the circulation, and so, without directly affecting the hemoglobin, further a cure by rendering possible the assimilation of the iron given internally.

The Waters of Dax.—Dr. A. Laranza of Dax lauded the effects of the waters in certain abarticular forms of chronic fibrous rheumatism, namely, retraction of the palmar fascia, and plastic induration of the cavernous body. The local application of the waters and vapors induce resolution of the fibrous infiltrations.

Argon and Helium in Mineral Waters.—Dr. A. Popskin of Spa, said that the recently discovered elements, argon and helium have been identified in various waters, Cauterets, Harrowgate, Voslau, etc. He went into great detail on the method of discovering these elements. He said further, that argon and helium do not appear to enter into the biochemical process. The air of inspiration and of expiration shows no difference in their amounts, and they cannot be recovered from animal or vegetable bodies by analysis. They, therefore, probably exercise no therapeutic action in the waters.

Syphilis and Hydrotherapy.—Dr. H. Keller of Reinfelden, said that physiotherapy, comprising hygiene, hydromineral treatment and hydrotherapy, are as important as medicine in the treatment of syphilis. Their combination is the ideal. In syphilitics who are of the lymphatic or arthritic constitution, or anemic or debilitated, it is of signal service and, in the severe cases, it is really specific. It is indicated in cases of idiosyncrasy against mercury. Sulphurous, chlorinated, and iodide springs are of especial value.

Tuberculosis and Hydrotherapy.—Dr. M. Cayeux of France said that certain waters, by their stimulating action serve to fortify the organism against the attacks of the bacteria, while, by their peculiar composition, they combated the catarrhs, congestion, and other "paratuberculous" manifestations of the disease. He detailed the special indications for various types of waters.

Argon and Helium.—Dr. R. Durand-Fardel of Paris read a paper of similar content and conclusions to that previously reported.

The Clinical Types of Pulmonary Tuberculosis and their Therapeutic Indications.—Dr. Régurier of Nice asserted that a rational and scientific mode of treatment of the disease necessarily presupposed an accurate clinical subdivision of its various types. There was only one logical basis for such a subdivision, namely, the degree of resistance which the organic economy opposed to the microbic infection. This alone, he said, determined the types and variations in the disease, and, at the same time, furnished the therapeutic indications. The reaction of the organism was of three possible grades, namely: (*a*) of unbending resistance; (*b*) of

less firm resistance; (*c*) of entirely inadequate resistance. Upon this basis he proposed a very complete regrouping of the various clinical types hitherto generally recognized.

The American Italy.—Dr. Chas. E. Nammack, of New York, read a paper in which he lauded Southern California under the above title. He asserted that it had fully as varied a climatology as Italy, and, like the latter, presents extremes of meteorological conditions. He described six distinct classes of climates which he said were to be found in that region, each one having a distinct value and application, as follows:

1. A purely insular climate at Catalina, Coronado, and other channel islands.
2. A peninsular climate, at Coronada Beach outside San Diego Bay.
3. The coast climate.
4. The foothill and valley climate, 200 to 2,500 feet elevation.
5. The mountain climate, 2,500 to 9,000 feet elevation.
6. The desert climate, from 360 feet below sea level to 2,500 feet elevation.

The Dynamogenic or Inhibitory Action of Light Massage.—Dr. Saquet of Nantes read a paper based on comparative dynamometrical measurements of the power of the hands taken both before and after massage had been administered to the individual. Generally, there is an increase in power. In some cases, however, there is, apparently, a diminution in the register of the dynamometer; even, in such cases, however, the equilibrium is generally restored within the period of ¼ hour.

Physicotherapy, Its Indications and Its Advantages.—Prof. A. J. Rivière of Paris read a most enthusiastic paper in praise of the physicotherapeutic agents, under which title he included electricity, heat and light. After a rather theoretical, or even mystical, discussion of their relation toward the vital processes, he came to their actual indications. They act chiefly by stimulating the emunctory organs, by altering metabolism, and by influencing the distribution of the blood to the various parts of the body. The diseases of city life ("nosopathies urbaines") are consequently its field, par excellence: gout, arthritism, dyspepsia, nervosity, all types of dystrophy, "uterine patients," in short the great group of chronic cases which have hitherto proved refractory to medical treatment, are the chief indications for physcico-therapy.

Importance of Revulsive Medication in Therapeutics.—Dr. J. B. Obregon of Spain read a very suggestive paper on this topic, in which he emphasized the long history and the logical importance of the counter-irritant method of treatment. He said that its action was most manifest in certain cases of acute edema laryngis, and bronchiolitis, in which prompt vesication immediately turned the tide of the disease. But it was indicated in all forms of internal inflammation in which it could be applied.

Pneumatic Bulbs for Aseptic Hypodermic Injection.—Dr. Pierre Laurent of Bois-Colombes suggested that the sealed bulbs containing medicaments for hypodermic injection, be modified by occupying the excess of space with gas under pressure, in order to facilitate the flow of the fluids.

Physiology and Therapeutics of Hypnotics and Narcotics—Dr. Vicente Peset y Cervera of Valencia read a paper of this title. He said that these agents were to be divided into such as exercise a direct effect upon the brain, and such as produce sleep indirectly. Cerebral fatigue has been shown, both by histological and chemical methods, to depend on an actual alteration of the nervous substance. These changes probably interest chiefly the nucleinic acids, and are probably induced by insufficient oxidations or the action of certain leucomaines. At all events, the *direct* hypnotics seem to act in the same fashion, though more harshly. The indirect hypnotics, and hypnotism, act upon the brain secondarily through the nerves, respiratory and cardiac functions. The theory of the retraction of the processes of the nerve cells does not satisfactorily explain sleep. The state of the intracranial circulation expresses the successive phases, or grades, of the action of the pharmacological hypnotics: first, active congestion (excitation); secondly, relative ischemia (hypnosis); thirdly, passive congestion (narcosis). Since there is no sleep center, the action must be a general chemical one upon the brain.

SECTION ON OBSTETRICS.

Treatment of Placenta Previa.—Dr. A. R. Simpson of Edinburgh said that most cases of placenta previa demanded immediate bipolar version, and slow extraction. If diagnosed late in pregnancy, and the hemorrhage has not been severe, an expectant method is indicated. In primiparæ, especially, resort should be had to preliminary tamponade of the vagina or hydrostatic dilatation. In marginal implantations, one may separate the placental lobules from the inferior uterine segment with the finger, which permits the os to dilate without fresh hemorrhage. The third stage demands the greatest care, with, at times, tamponade of the uterus.

The Effects of Treatment at Franzensbad.—Dr. L. Steincber of Franzensbad read a paper on the baths, in which he said that those which ranged within the indifferent zone, 1. c. 26 to 30.5 R, were especially suited, by virtue of the marked physiological reaction which they induce to feminine ailments, constitutional diseases and certain forms of heart and vascular disease. The baths of higher temperature have the same value as other hyperthermic source.

Hysteroscopy.—Dr. S. Clado of Paris described certain important modifications of his hysteroscope. He said that in uterine hemorrhage, the hysteroscope enabled the surgeon to determine the site and nature of the lesion. It may be employed in case of foreign bodies, and is of prime assistance in determining cases of placental retention and of unrecognized induced abortion.

Hysterectomy for Uterine Sepsis.—Dr. T. Costiguera of Santander said that cases in which the uterus did not yield to intra-uterine treatment should be hysterectomized. The most favorable cases were those in which the infection was limited to the uterus, the adnexa, and pelvic peritoneum, but neither general peritonitis nor general sepsis were a contraindication. Collapse and descending infection furnished rational contraindications.

Early Diagnosis of Extra-Uterine Pregnancy.—Dr. G. Caldevini of Bologna detailed the symptoms of this condition as at present understood: Metrorrhagia following a period of amenorrhea; amenorrhea; a round elastic tumor, antero-lateral to uterus; the concomitant symptoms of pregnancy; an enlarged uterus of pregnancy, but empty; local pains; menstrual decidual cells; a uterine membrane. Cases of slight internal hemorrhage similate intestinal colic.

Face Presentations and their Prognosis.—Dr. W. Nagel of Berlin combated the general belief that face-presentations with chin posterior were of bad prognosis. He said that this position occurred as a very natural and frequent evolution of primary occipital presentations, and almost invariably righted itself by rotation of the chin anteriorly. Narrow pelves may prevent the entrance of the face, as of the head in other forms of presentation, and always indicate early version. Truncate

dolichocephaly, as contrasted with the acquired forms, is an important factor in face presentations.

Dr. W. Nagel of Berlin further described his method of restoring the perineum.

Operation for Retroflexio Uteri Mobilis.—Dr. A. Schucking of Pyrmont fixes the portio vaginalis, and the fornix posterior vaginæ by means of two circular ligatures of silver thread, which remain in place 4-6 weeks. In 18 cases, the results were almost always satisfactory. In one case, he replaced Schulze's pessary by an injection of paraffine into the anterior fornix.

Electrothermic Hemostasis in Surgery.—Dr. A. J. Downes of Philadelphia said that there were many objections to the use of sutures. He said that with a measurable source of electricity and proper apparatus, electrothermic hemostasis was in many respects a more perfect method. One could employ hemostasis en masse, and in detail of each vessel. Appendicectomy, salpingo-oophorectomy, etc., might be performed by this method. The scars were less irritable, and there was less tendency to form adhesions.

Treatment and Prophylaxis of Neoplasms.—Dr. A. J. Rivière of Paris said that hydroelectric baths combined with friction, carbonic acid baths, faradic currents, and vibrating massage were of great assistance in the treatment of fibromata, by suppressing the pain and the metrorrhagia, and relieving the local congestion. In many cases, it replaces operation. Physicotherapy prevents malignant degeneration of benign tumors.

Metritis.—Dr. P. L. González of Madrid said that the most frequent form of metritis was that involving the glandular apparatus, with either atrophy or hypertrophy; disease of both glandular and interstitial tissue is frequent, but disease limited to the interstitial tissue alone is rare. Non-infectious metritides tend to involve single histological elements, while the infectious forms involve all the tissues. Glandular disease occurs in the metritides post-abortum, and there is atrophy at the change of life. Hemorrhage is the predominant symptom of metritis in multiparæ, leucorrhea in nulliparæ. The hemorrhage seems to depend on glandular disease. He reported 3 cases of metritis post-abortum with papilliferous growths, and very severe hemorrhages.

SECTION ON NEUROLOGY AND PSYCHIATRY.

Folies Toxiques.—Dr. J. Galiana of Madrid read a paper on those cases of chronic alcoholism in which mental degeneration entered as a complicating factor. In such cases the manifestations of chronic and of acute alcoholism are noticeably different from the pure types. In some of these cases acute attacks may resemble the suspension of mental functions of epileptics. The disturbances of chronic alcoholism are accentuated. The terminal dementia occurs earliest. Instead of the motor system, it is the psychical system, as the point of least resistance, which first breaks down. Alcoholism tends to accentuate and develop all previously existent psychical anomalies. In epileptics it multiplies the number of attacks, but is never a cause of the disease per se. In hereditary neurotic or degenerate individuals, alcohol tends much more rapidly to induce delirium; a single debauch may thus precipitate a typical delirium in such cases. The speaker then proceeded to a discussion of the syphilitic psychopathies. Secondary syphilis produces psychical aberrations in degenerates, inducing these effects both through the mental anxiety, the anemia, and possibly cellular intoxications. True syphilitic psychoses are perturbations of the order of delirium, of dementia and of the motor functions. The last are of great diagnostic import, and may be either paralytic, convulsive, tremulous, or ataxic. He then detailed the various clinical forms of syphilitic motor disturbances, especially pseudo-general-paralysis. It is a factor in most cases of true general paresis which occurs in spite of an early and thorough antisyphilitic treatment, and also persists in spite of it.

Evolution of Ideas of Delirium in Anxious Melancholia.—Dr. M. Lemos of Porto discussed with great finesse a development of these ideas from a pathological, psychological standpoint.

Voluntary Motion.—Dr. H. Frenkel of Switzerland, famous for his work in locomotor ataxia, urged certain novel ideas on the subject of voluntary motion. He said that motion never existed as the function of the will alone, but was always determined by sensory stimuli. Serious disturbances of sensibility and anesthesia consequently resulted in pronounced disturbance (ataxia), or abolition of motion.

He then passed on to a discussion of the value of re-education in tabes, which, he said, completely overthrew the doctrine of the progressive nature of the disease. He was successful, he said, in re-educating even the severest cases of ataxia. He deprecated the use of the apparatuses of Leyden and Jacob.

Pseudosclerosis.—Dr. L. Von Frankl-Hochwart of Vienna read a paper on this type of disease first described by Westphal, in which he said that it could be diagnosed, though with difficulty, during life. From multiple sclerosis it differs in the absence of nystagmus, of the lesions of the optic nerve, and the sensory disturbances, of the facial and palatal paralysis, and finally of the sphincteric paralyses, and in the frequent presence of mental disturbances; the scanning speech and the tremor also differ in certain details. The disease presents no anatomical lesions, but is not hysterical, from which it is distinguished chiefly by its occasionally rapidly fatal course, the decubitus, and other symptoms. He then passed on to a consideration of diffuse general sclerosis.

Psychiatry as a Clinical Science.—Dr. P. Pregowski of Heidelberg said that the chief element of progress in modern psychiatry had been the recognition of mental states (depression, mania, etc.), as symptoms, or periods, of various types of disease, and not as diseases *sui generis*. He said that the study of the associated bio-chemical changes in such cases, and of pathological psychology were of the greatest importance for future progress.

Neurasthenia and Disturbances of Speech.—Dr. H. Gutzmann of Berlin said that neurasthenia was frequently associated with disturbances of memory and of the faculty of the association of ideas (Akataphasia, Akatagraphia, amnesia); secondly, by spasmodic or ataxic disturbances of the motor function of speech (stuttering, etc.). All these disturbances are increased by emotional excitement. The first class of disturbances were subject to cure by the ordinary treatment of neurasthenia; the second demanded special exercises.

Treatment of Esophagismus.—Dr. S. Dubois of Sanjou said that the proper treatment of esophagismus should always be directed to the cause, if ascertainable if not, suggestion, and the use of physico-therapeutic agents (dilatation, electricity) sufficed to effect a permanent cure.

Treatment of Epileptics.—Dr. F. Beach of Kingston Hill said that epileptics might be divided, with reference to treatment, into those with mental disturbances, and those without. He reviewed the methods hitherto employed, and also suggestion, for the treatment of the former class. The epileptic asyla of Maghull and of Meath, and the colony at Chalfont, he said, gave evidence of the great progress which had been made in the treatment of the condition.

SECTION ON DISEASES OF CHILDREN.

Treatment of Tuberculosis in Children by Meat Juice and Raw Meat.—Dr. A. Josias and Dr. T. C. Roux of Paris presented the results of their treatment of children with 150 gms. of muscle juice and 100 gms. of raw meat each day, in 46 cases of tuberculosis of all types, of which 30 had pulmonary affections. They conclude that the treatment ameliorates the general condition noticeably, increases the weight, and arrests the progress of the local disease. Moreover, the cure is permanent. In cases of very profound disturbance and advanced cavity-formation, the treatment is frequently without avail.

The Bacterial Agent of Chorea, Endocarditis and Rheumatism.—Dr. F. J. Poynton emphasized the clinical evidence in favor of the rheumatic origin of chorea. He said that after injecting a rabbit with the diplococcus of rheumatic fever, the animal had developed a chorea, and the micro-organism was demonstrated in the pia mater and the endothelium of the cortical capillaries. This had been repeated by Fritz Meyer. Paine had also found micrococci in the mitral valve, the cortex and the pia, in a case of human chorea. The urine in one case of chorea presented the same diplococcus, which produced chorea, endocarditis, and rheumatism in a rabbit. But, he said, chorea might also be caused by other bacteria, as those of erysipelas, or the pyogenic forms.

Spinal Cocainization in Children.—Dr. P. B. Diaz of Laragossa presented reports of a series of 15 operations on children varying from 4 to 16 years of age with spinal cocainization. The results were very satisfactory.

Treatment of Ophthalmia Neonatorum.—Dr. J. V. Portello of Valencia read a long paper reciting all the details of his treatment in cases of ophthalmia neonatorum; the chief point of importance was his condemnation of nitrate of silver, of corrosive sublimate, and of iodoform, which are too caustic and only promote the progress of the infection; on the other hand he lauded protargol. He described a new irrigator, made by Luer, of Paris.

Coryza in Nurslings as a Symptom of Syphilis.—Dr. L. Carralero of Madrid said that persistent coryza is one of the most constant, in the majority of cases, the earliest, and, at times, the *only* symptom of precocious hereditary syphilis. In the latter case, the differential diagnosis may be difficult, but all cases of rebellious coryza in infants should be laid to the door of a diathesis or of syphilis. In itself it is a very dangerous condition, inasmuch as it prevents proper suckling, and leads to broncho-pneumonias, otitides, etc. The treatment is, of course, a general anti-syphilitic one, combined with local measures.

Periods of Growth.—Dr. J. Atlassoff of Kiew said that growth was particularly rapid at certain periods of life, which periods varied from one to three in number in various individuals. These periods are marked by predisposition to disease. During such times the organism should be subjected to no unnecessary strain, especially not to that of overstudy.

The Muscular Dystrophies.—Dr. Criado of Madrid advanced the theory that the disease was of bulbar origin, supporting his contention by the general clinical aspect of the cases, but by no pathological proof.

Serotherapy in Diphtheria.—The noted French President, Dr. Jules Comby, read a very full paper on serotherapy in diphtheria. He stated that its effects, both locally and generally, were of enormous benefit. The subsequent anemia, languor and feebleness were due not to the serum, but to the diphtheria. It might, however, produce menorrhagia or metrorrhagia, also urobilinuria, albuminuria and other urinary disturbances, which were, however, only ephemeral. In every case of even suspected diphtheria the injection should invariably be made, even if the case were of mild type. In cases of laryngeal diphtheria, of malignant types, or late cases, the dose should be doubled, and may be repeated in 24 hours. The injection is indicated in all localizations of the infection, and for postdiphtheritic affections (paralysis). Malign cases present no contra-indication. In benign cases, if complicated by a pulmonary tuberculosis or by an old nephritis, only feeble doses should be employed. The serum decreases the mortality by three-quarters, and, if employed within the first 48 hours, abolishes it. The most serious and confusing complication is furnished by the eruptions, which may be primary (first day) early (within one week) or late (two weeks or more); they are accompanied by fever, and uremic measles, scarlet and other exanthens.

Treatment of Clubfoot.—Dr. O. Vulpino of Heidelberg, said that all cases of hereditary clubfoot should at first be treated by gradual redressement, which might, if necessary be replaced by operation. Paralytic cases are to be treated by redressement, by transplantation of tendons, if there are any sound muscles, or, if not, by arthrodesis. Orthopedic apparatus are only a last resort.

Human Milk for Infants.—Dr. Monti of Vienna urged that in view of the fact that human milk was the only proper food for infants, it should be made accessible to all classes of the population. He proposed the foundation of institutions of wet nurses, for the use of such of the poor as have need for it.

Is Tuberculosis Transmissible by Cow's Milk?—Dr. H. Rehn of Wiesbaden stated that in a case under observation, bovine tuberculosis had not been transmitted through the milk to a human infant.

SECTION ON SURGERY.

Radical Cure of Femoral Hernia.—Dr. O. v. Lassen of Denmark said that the methods of Salher or of Schwartz, by which a muscular flap of the pectineus was dissected off and attached to the crural canal, were inefficient, inasmuch as the muscle tends to atrophy. He prefers to sew the fascia of the pectineus to Poupart's ligament as far as the falciform process, introducing his needle armed with not too fine gut a little deeply into the muscle itself, and taking 5-6 stitches. The method is almost always applicable. In 45 cases he has seen only 3 recurrences, of these cases 31 had a record of 2-6 years. The recurrences were excusable, and due to exceptional circumstances.

Operative Treatment of Cutaneous Tuberculosis.—Dr. H. Morestin of Paris said that extirpation was the only method of treatment. In a second communication he described a plastic for prominent tears, comprising the excision of posterior bands, and of pieces of cartilage. In a third communication he condemned the operation of interilio-abdominal disarticulation. In a fourth, he reviewed the methods of cheiloplasty. In a fifth, he described an "esthetic" operation, suitable for cases of slight inguinal hernia, in which the incision is made in the hairy region over the pubes, horizontally or vertically. It is especially suited to congenital cases, and does not permit of complicated sutures.

Multiple Intra-abdominal Cysts.—Dr. A. N. Psaltoff of Smyrna reported a case in which he had, at a single operation, done splenectomy, partial hepatectomy, and removal of a large cyst of the mesentery.

Filling of Bone Cavities.—Dr. M. Silbermark of Vienna described Prof. Mosetig-Moorhof's method, which consists in removing all diseased bone and work-

ing well into healthy areas, drying the cavity with hot air, and then filling with a preparation of lead. He exhibited the metal and the instruments. He showed, by Roentgen photographs, that the lead is gradually absorbed and replaced by fresh bone.

Operation on the Palate.—Dr. T. W. Brophy of Chicago gave a stereoscopic exhibition of his method of closing cleft palate. He said that the operation should be done in the first 3 months. The palate bones are forcibly held together by sutures of silver wire.

Surgery of the Stomach.—Dr. H. Hartmann of Paris said that for neoplasms ablation was the only operation; in other words, in all suspected cases in which medical treatment had been inefficacious, laparotomy was indicated. For cancer of the pylorus, free excision should be done, together with the ganglionic chain accompanying the branch of the coronary. Of the palliative operations, partial pylorectomy is preferable to gastro-enterostomy. Cancers of the body should also be extirpated. For benign stenosis, operation affords immediate relief, and has no greater mortality than herniotomy. Hour-glass contracture and painful adhesions give good results. For the acute hemorrhages of ulcer he recommends operation only in those cases complicated by pyloric stenosis, with gastric unrest; here gastro-enterectomy is the best sedative and hemostatic. Ulcers, which remain painful in spite of treatment, gastrosuccorhea, and rebellious hyperchlorrhydria, if accompanied by the pyloric syndrome, probably indicate an ulcer at the outlet, and demand operation.

Epiploitis After Resection of the Omentum.—Dr. J. Ortiz de la Torre of Madrid pointed out that the numerous sutures which had to be sunk in the abdomen, in cases of hernia in which the omentum was resected, multiplied the chances of infection. It manifests itself 8-10 days after operation by fever, pain and tenderness. It tends, rather slowly, to the formation of abscesses, which point either to the exterior or to the intestine, and tend to be well walled off from the peritoneum by adhesions. Treatment should be expectant and narcotic until the abscess points. The speaker urged hemostasis in epiplorectomy by some other method than suture.

Surgery of the Stomach.—Prof. A. Cecherelli of Parma detailed the various maladies of the stomach, and posed as a champion of surgical intervention. He asserted that in very many cases operation accomplished its object, not by attacking the primary malady, but simply by permitting the stomach to empty itself more freely. The organ thus gains the repose necessary to recovery. He held that even the functional disorders, if severe, indicated operation.

Heat for Tuberculosis.—Dr. S. Clado of Paris said that heat to local and accessible foci was a valuable mode of treatment.

The actual cautery by hot wire puncture had been proven to be one of the best modes of treating lupus previous to the rise of the Finsen light therapy. In some instances the actual cautery can be applied to a tuberculous focus.

SECTION ON MEDICINE.

Symptoms of Muco-membranous Enterocolitis.—Dr. Froussard of Plombières-les-Bains said that the constipation and the pain were due to the spasm. The spasm revealed itself in the character of the stools, "crayon-like," etc., and also in the results of abdominal palpation. The hypersecretion seems to be of a purely nervous nature.

A Rational Cure of Tuberculosis.—Dr. Marcel Monier of Liège said that mistakes in phthisiotherapy were traceable to the notion that the bacillus could be directly attached. The only true method is to build by the organism, by zomotherapy, fresh air, and full feeding.

Malaria.—One of the most actively discussed subjects in the section on medicine was the general subject of malaria. It was largely attended. Some of the papers are here presented—others will be given next week.

Malarial Fever.—Drs. Barrera and Pittaluge of Spain spoke on the subject of paludism in that country. They said that Grassi, of Italy, and not Ronald Ross of England, was the real discoverer of the transmission of the quartian, tertian, and estivo-autumnal types of this disease were due to different species of parasites. The recrudescence of malaria in times when the parasites are not capable of being transmitted by the mosquito is due to the parthenogenesis of the gametes. These having a continuous cycle of development which bridges over successive epidemics. These gametes seek the internal organs during the disease. Thus, as an example, it is known that the crescents can multiply by nuclear differentiation, as this may take place in June and may reinfect young mosquitoes. The quotidian type of the disease he believes may be due to the estivo-autumnal parasite, or it may be a rapid development of the tertian parasite. Further, there may be an independent species of parasite causing this type of disease.

Hydrographic Conditions.—They further said that in the acute and chronic estivo-autumnal forms the most diverse hydrographic and topographic conditions pleased the plasmodium, and that in view of this fact the plasmodium could live under so many diverse conditions that extermination of the mosquitoes that might be infected would prove a large undertaking.

Prophylaxis.—The prophylaxis directed toward the extinction of the mosquito in view of this peculiar hydrographic versatility of the plasmodium rendered the hygienic means of prophylaxis on the question of the extinction of the mosquito most expensive and practically inefficacious. The most efficient means of exterminating the disease he believed was to mechanically protect the patient who was affected by it. Thus every patient with malaria should be thoroughly screened off by mosquito netting in order to prevent the mosquitoes infecting themselves. Inasmuch as the individual cases suffering from malaria can be better looked after and taken care of than can the mosquitoes of the woods and streams, this method he believes will prove most satisfactory. As far as drug treatment is concerned, quinine is, of course, the best, and these authors state that during the latent period of winter, quinine can be given to advantage.

Recrudescence of Malaria.—Dr. Ascoli of Rome emphasized the importance of malarial recrudescence in Italy. He said that malaria in epidemic form appeared in June, notwithstanding the fact that at this time there could be but relatively few infected mosquitoes. Most of these patients show, however, an antecedent malarial history. He described two types of recrudescence, one with a brief interval, with a longer cycle, the former he thought was due to imperfect extinction of the parasite by antimalarial remedies, the latter due to parthenogenesis of the organism itself. This latter type communicates successive epidemics. He considered that the proper mode of prophylaxis was to look after the infected individual. Mosquitoes are always being born to be infected, and thus to transmit, whereas man is the more permanent host.

GENERAL PAPERS.

Hot Air in Rhinitides.—Dr. M. Lermoyez and G. Mahn of Paris said that their method of treatment of vasomotor rhinitides, ranging from the congestive type with obstruction to the cases of hypertrophy and hydrorrhea, enabled them to count their cases of cure by the hundred. A necessary preliminary is the removal of all mechanical obstructions, after which the treatment acts as a specific. The instrument is made by Collin, in Paris.

Symptoms of Antral Disease.—Dr. G. Mahn of Paris said that it was necessary to distinguish cases in which the antrum simply acted as the reservoir of pus formed elsewhere, and cases of true chronic maxillary sinusitis. In the latter condition, the wall becomes very much thickened and diminishes the capacity of the cavity, a fact which enables us to diagnose the case. The fluid contents of the cavity below a plane through the level of the ostium, is measured by an aspirator, and if found not to exceed 1½ c.c., may be held almost invariably to indicate true sinusitis. He then exhibited a series of new instruments.

Etiology of Ozena.—Dr. W. Freudenthal of New York said that ozena is an atrophy of all the inner coats of the nose, due chiefly to excessive dryness of the air, complicated by the secondary invasion of a bacillus. The micro-organism cannot enter unless the soil has been previously prepared in this fashion. Sinusitises are frequently secondary to the ozena.

Is Atrophic Coryza Autonomous?—Dr. E. J. Moure of Bordeaux discussed in great detail the various forms of atrophy, rhinitis, and ozena, and their combinations. As regards treatment, he said that it was sufficient, in case of the purulent ozena of adults, to suppress the inflamed adenoid tissue, and to employ nasal lavage. Massage, with pulverizations of silver nitrate, is an excellent mode of treatment. Hypertrophied mucosæ tend gradually to disappear, even if cocaine and adrenalin do not affect them, and excision is very dangerous. In pseudo-atrophic strumous ozena, lavage and general constitutional treatment suffice to cure the rhinitis. Complicating sinusituses demand surgical intervention. Finally, in true atrophic ozena, in young children, one should employ simply regular lavage, until the patient has attained an age suitable to operative procedure. At this point the nasal cavity is reconstituted by means of interstitial injections of paraffine, which fill out the cavity and prevent the accumulation of foul-smelling and decomposing secretions.

Obligatory Report of Tuberculosis.—Dr. H. Tabor of Prague recited six very strong arguments for the general prophylaxis of tuberculosis, based on reports of every case of tuberculosis, of death from the disease, or of change of lodging of diseased persons.

The Intellectual Life.—Dr. L. Bares of Saint-Gaudens said that intellectual labor predisposed to digestive disturbances, to disturbances of nutrition, and to nervous breakdown. He recommended a severe alimentary hygiene, with prescription of rich indigestible foods. Alcohol and tobacco are interdicted. The brain-worker must exercise in the open, keep his bowels open and his skin active, and must be a milk-drinker. Sleep is the criterion of the nervous condition, and should be undisturbed.

Paludism and Its Transmission.—Dr. F. Hauser of Madrid said that *Anopheles* did not furnish the only intermediate host for the malarial parasite. The germ might live in humid earth under favorable conditions, and the disease might flourish in regions free from mosquitoes. The hematozoon may exist in some unknown form in the earth, whence it is conveyed by the air or by mosquitoes to the blood. The inhalation from dried marshes, or the drinking of water infected by the bodies of dead mosquitoes could infect. Mosquitoes dying in marshes set free the organism which infects man through the medium of the air.

Permeable Urachus.—Dr. B. Guisy of Athens reported two cases, one of a man of 38, another in a prostatic of 60, both cases having been attacked by ischuria. He also reported a case of extraction of a fetus of about three months from the bladder of a woman who had had an ectopic abortion.

Radical Cure for Hypertrophy of the Prostate.—Dr. A. Pousson of Bordeaux reported his experience with the various methods for the treatment of prostate. Orchidectomy, single or double, has its dangers for old men, and produces very inconstant results. Vasectomy and angioneurectomy do not reduce the prostate, but tend to prevent the congestive attacks of that gland, which so often induce acute ischuria. Suprapubic prostatectomy rarely improves spontaneous micturition, but facilitates lavage of the blood, and so diminishes the chances of ascending infection. It is better borne by very old men than is the perineal operation. The latter procedure, however, with total extirpation of the gland, is the single rational and radical cure.

Surgical Intervention in Nephritis.—Dr. A. Pousson of Bordeaux said that his results agreed with those of Harrison and of Edebohls and led him to believe that operation could at least ameliorate, or for a time arrest, the course of a chronic Bright's. He advises decortication only for the more or less latent periods (périods de tolérance) of the disease, while cases of frank uremia, with oliguria, diminution of urea, etc., demand nephrotomy. The good effects are attributable to relaxation of intrarenal tension, to improved circulation, and absorption of infiltrations. In all his cases, he has seen improvement in the urine, and disappearance of the hydremic and uremic symptoms.

Functional Renal Diagnosis.—Dr. A. Hogge of Liège said that all the new methods of diagnosis were of value, but failed to give an exact measure of the kidney functions. They allowed of a *comparison*, in other words, of the two organs, and so served as a check on surgical intervention.

Prostatectomy.—Dr. S. Clado of Paris said that the suprapubic route was indicated solely for cases in which the middle lobe formed a tongue in the bladder. The perineal route is the operation of choice; complete extirpation is advisable, but not absolutely necessary. Incision of the urethra must be avoided. If there is an independent, pedunculated projection into the bladder, the perineal operation is to be supplemented by a suprapubic incision. In prostatovesical tuberculosis alone is incision of the urethra advisable.

Electrolysis for Stricture.—Dr. J. A. Fort of Paris said that linear internal electrolysis is easy and almost painless. There is little loss of blood, and little danger of urinary fever. No permanent sound is necessary. There is immediate relief and no shock. In 40 cases the mortality was nil.

Malignant Tumors of Kidney.—Dr. R. Mollá of Valencia read a paper in which he expressed the generally accepted views on operation for kidney tumors.

Changes in the Vessels and Lymphatics in Syphilis.—Dr. A. Ravogli of Cincinnati asserted that syphilis is the disease of the lymphatic system, *par ex-*

cellence. Microscopically, there is an increase of the epithelial cells lining the lymphatic vessels, with infiltration and desquamation. Many of the lymphatics are obstructed by thrombi and coagula, while the walls are inflamed and infiltrated with polynuclear leucocytes. The arteries present the same lesion, with an especial predisposition on the part of the endothelia. The veins are thickened and brittle. In addition to this phlebitis and arteritis, there may be gummatous infiltration of the walls of the vessels.

Radiotherapy.—Dr. Chas. Warrenne Allen of New York asserted that many diseases of the skin, including cancers of different types, were ameliorated or cured by the X-rays. Protective media should be employed and, although there should always be a slight degree of dermal irritation, profound burns are unpardonable errors. In malign growths, the resultant scars are better than those after curettage or caustics.

Leprosy in Spain.—Dr. J. G. Castellano of Javea said that leprosy was frequent in Spain and was endemic in certain provinces. He urged that asylums should be widely distributed for the detention and isolation of all cases, in order that the disease might be exterminated.

Parasyphilitic Diseases.—Dr. J. N. Hyde of Chicago said that as there were certain symptoms which occurred in other diseases but never in syphilis and, as there were other conditions, *e.g.*, the gumma, which occurred in syphilis and in syphilis alone, so, finally, there is an ambiguous set of conditions which occur both in syphilis and in other conditions. This third group he calls the parasyphilides, and includes in it general paralysis, tabes, leucoplasia, buccalis, stricture of the rectum, etc.; the etiological diagnosis is here of absolute importance for the cure. Dr. G. Ogilvie of London combated the theory of parasyphilitides as originated by Fournier, and attacked both the diagnostic and therapeutic system advanced by the French author. He said that parasyphilis was not a discovery, but an invention.

Purpura.—Dr. A. Jamieson of Edinburgh said that purpura, comprising cases of hemorrhage into the skin, mucosæ, and internal viscera, is only a symptom of very diverse conditions. Of these, he mentioned, the circulatory disturbances of heart disease; the rheumatic forms, including Henoch's type, and, finally, the purpuras due to drugs, especially iodide of potassium. It may replace the exanthemata. It complicates certain diatheses—scurvy and hemophilia. Rupture of a vessel, rather than diapedesis, is the most frequent lesion, and is due to fatty degeneration of its walls and variations of caliber.

Human Blastomycoses.—Dr. Hyde of Chicago said that blastomycosis might be due to cutaneous, or to pulmonary infection, in which latter case the skin was secondarily involved through the medium of the circulatory channels. Blastomycosis might result fatally through toxemia induced by the simultaneous invasion of a large number of viscera. The so-called protozoal infections can no longer be differentiated from blastomycosis. It is no longer possible to speak of dermal blastomycosis; the disease is to be regarded as general, with localization especially in the skin.

Hysterectomy in Acute Affections.—Dr. Pinard of Paris read a paper on this subject. He said that there was no rational indication for removing the uterus in acute affections, excepting in those cases where putrefaction resulted from trauma. This accident was likely to occur in fibromata, and in this condition alone is it indicated. In cases of acute infection the autopsy of the patient rarely shows localized lesions, and the presence of bacteria in the blood does not affect the prognosis in the least. Bacteriological investigation of the uterus he considers of very minor clinical value, as it is impossible to localize the infection to the uterus and the determination of the advisability of an operation is difficult.

General Infections.—Dr. Cortajeva of Madrid said that general infections diminished the importance of the uterus as primary agents. Chronic infections never justify a hysterectomy, and as for the proper moment for operation it is almost impossible to determine! Early hysterectomy he believed had many disadvantages and required secondary conservative surgery of the adnexa.

Mortality of Radical Operations.—Dr. Treub of Amsterdam maintained that radical operations had a very high mortality. A cure cannot be guaranteed in any case, and the highest justifiable estimate of the percentage of cures is not over six per cent. Moreover, the secondary consequences are prolonged and disagreeable. In the conservative operation the mortality is very low, not over two per cent. succumbing, but following a conservative operation secondary operations may be necessary. He believed that salpingo-oöphoritis could be treated medically, and it was never wise to induce profound constitutional disturbances by radical operations. Posterior colpotomy he believed to be a conservative and safe operation in rebellious or sterile cases, but it was not to be advised in inefficacious cases and particularly to be avoided in tuberculosis.

(To be Continued.)

THE MEDICAL ASSOCIATION OF THE GREATER CITY OF NEW YORK.

Stated Meeting, April 13, 1903.

The Vice-President, Ransford E. Van Gieson, M.D., in the Chair.

Non-Medicinal Treatment of Constipation.—The paper of the evening was by Dr. Samuel G. Gant, on this subject. The failure to obtain good results in habitual constipation he thought was often due to the injudicious prescribing of purgatives and enemata when the costiveness was caused by conditions of the lower bowel requiring operation or local treatment. Many other cases are the result of improper modes of living, with a lack of intestinal tonicity and glandular secretion, and must be treated by correcting the faulty conditions. In this class of cases the physician is apt to overdrug the patient and to disregard more rational methods, which may be less satisfactory in the beginning, but which eventually effect a permanent cure. For many years Dr. Gant has not resorted to the use of drugs for the relief of constipation, and in the meanwhile he has successfully treated several hundred cases by the non-medicinal method. In the few exceptional instances in which the patients were not permanently cured, they were relieved to a greater or less degree.

The principal features of the treatment practised by him consist of the proper education of the patient, together with the administration of enemata when necessary, massage, electricity, divulsion or division of the sphincter muscle, and valvotomy, any or all of these being carried out as the case demands. Persistence in the treatment is an essential requisite for success. Regularity in the manner of living must be insisted on. The patient should abstain from foods which disagree with him or tend to clog the bowel, and laxative fruits,

to be eaten preferably in the morning or at bedtime, should be included in his dietary. Two or three glasses of water taken on rising constitute an excellent laxative, and the free drinking of water throughout the day is of service in softening the feces and stimulating intestinal peristalsis. Those engaged in sedentary occupations should take plenty of systematic indoor or outdoor exercise. In the numerous cases in which the constipation is complicated with auto-intoxication, a morning cold bath, followed by a salt rub or vigorous friction of the skin with a Turkish towel, is of much service in promoting elimination. A systematic effort (to which sufficient time must be devoted) to evacuate the bowels should be made at a given hour daily.

Dr. Gant regards the regular daily use of enemata as a most pernicious practice. In some instances, however, rectal or colonic injections are advisable early in the treatment, in order to secure necessary evacuation and prevent fecal impaction. Massage is an essential feature of the treatment. In addition to kneading the large intestine, special massage is given over the liver and small intestine and locally to the rectum. The table on which the patient is placed is so arranged that the head may be raised or lowered and the body rotated from side to side, so that the intestines may be changed from one position to another. With the palm of the hand and ball of the thumb the operator makes firm but gentle pressure over the large intestine, beginning in the right iliac fossa and following the course of the colon over to the left; accompanying the pressure by thorough kneading of the parts with the fingers. These manipulations are repeated several times at each séance, and the treatment should occupy 10 or 12 minutes. It is practised every day at first and later twice a week. If unable to pay for the services of a masseur, the patient may receive much benefit from daily rolling, while lying in a recumbent position, a cloth-covered metal or bowling ball over the course of the colon.

In combination with other measures, he has found electricity of value in many instances. The positive electrode is placed over the spine or in the rectum or sigmoid colon, while the negative is moved about the abdomen over the region of the liver, the small intestine, and the colon. As, in his opinion, hypertrophy or irritability of the sphincter muscle is an important factor in the etiology of constipation, its divulsion or division is frequently indicated. Gradual divulsion may be accomplished by the introduction of one, two and then three fingers until the muscle has become sufficiently relaxed, or by the use of the Kelly or Pratt anal dilators or of Wale's graduated rubber bougies. Forcible or rapid divulsion, for which general anesthesia is required, is best accomplished by stretching the muscle in every direction by means of the thumbs. In cases in which the sphincter is so thick and rigid that sufficient relaxation cannot be obtained by divulsion, division is necessary. After the injection of a 3-per-cent. solution of beta-eucaine into the section of the sphincter to be incised, a bistoury, guided by the finger, is introduced well above the muscle and then withdrawn; in this way all the fibres are completely divided laterally or in the posterior median line. The after-treatment is the same as that for cutting operations for fistula.

When one or more of Houston's valves have become so hypertrophied as to obstruct the descent of feces, as is occasionally found to be the case, valvotomy is indicated. Martin was the first to suggest division of the thickened valves for the relief of constipation. After describing his operation Dr. Gant stated that it was open to serious objections. Among these are its difficulty of performance, the considerable time required, the danger of hemorrhage, infection and peritonitis, the great pain due to the presence of the tampon left in the rectum, the confinement of the patient in bed for a week or more, and the fact that no part of the obstructing valve is removed. As a substitute for the Martin operation Pennington suggested a clip for the purpose of dividing the valves by pressure-necrosis. With this idea in mind, Dr. Gant has devised a fenestrated valve-clamp and forceps applicator, which render the operation extremely simple and devoid of danger. For the performance of his procedure the patient is placed in the knee-joint posture and a proctoscope so adjusted that the border of the valve crosses the center of its aperture. The applicator carrying the open clamp having been introduced, the clamp is slipped well down over the valve and released, and the forceps and proctoscope are then withdrawn. The clamp should divide the valve in from four to six days (the time depending on the amount of fibrous tissue present), and when it is then discharged with the feces it carries the section of tissue within its grasp.

This clamp operation can be painlessly performed in the office in from one to five minutes. It is attended by no danger of hemorrhage, infection or complications; no dressings are required, and the patient, who is not detained from his usual avocations, suffers but little, if any, discomfort. Furthermore, it is more effective than the cutting operation, since it removes a section of tissue nearly half an inch wide and almost an inch long, thus insuring wide separation of the remaining segments of the valve. Valvotomy, while unquestionably indicated in certain instances, is not called for in so large a proportion as its most enthusiastic advocates would have us believe. In cases of long duration it is sometimes necessary, after the rectal valves have been divided, to properly educate the patient, and carry out the various other measures mentioned in order to overcome the habitual constipation. In conclusion, Dr. Gant stated that in his experience the results obtained from the non-medicinal method were far more satisfactory and permanent than those following the use of drugs.

The Value of Valvotomy.—Dr. Robert T. Morris said that at first he had felt suspicious as to the number of cases in which the rectal valves constituted an obstruction to the passage of feces. He was skeptical because some of his friends failed to find these valves at all. Afterward, however, he himself had seen them congested and thickened, and it seemed to him hardly possible that any one who had observed them in such a condition could deny their evident mechanical agency in promoting chronic constipation. As to the proportion of cases in which valvotomy was of value, this could be determined only from statistics very carefully collected by experts. It was his own conviction that the percentage was fairly large, at all events large enough to be eliminated. In his personal experience he had found that in a number of cases in which he had expected prompt relief from the procedure, the good results had not been so prompt as he could have desired. In other instances, however, immediate relief had resulted. He thought there could be no question that the condition of the valves spoken of in the paper constituted the chief factor in the distress from which a certain number of individuals suffered all their lives. He here referred to the case of a young lady of a wealthy family who had been a life-long sufferer from obstinate constipation. She had had for many years the best medical advice both in this country and abroad, yet her condition remained unimproved. By valvotomy, however, she was instantly and permanently relieved. If, therefore, this procedure acted as favorably in only one case in a hundred, he thought it was deserving of recognition as a valuable resource.

Chronic Constipation Both a Symptom and A Cause of Disease.—Dr. Edward W. Peterson said constipation was both a symptom and a cause of a number of rectal, as well as constitutional, affections. In order to get a satisfactory result, it is necessary to treat all the factors of the condition, whether local or constitutional. It is well known that constipation frequently results from the passive congestion due to cardiac disease or cirrhosis of the liver, and also from the muscular relaxation which often follows acute diseases. Here it is desirable to give tone to the intestine, and the various measures recommended by Dr. Gant are valuable adjuncts to the treatment. Bu these will prove inefficient in cases where the trouble is due to another class of cases, such as lead-poisoning, for instance, where antidotes to the poison must be resorted to. There are many cases where the constipation results from reflex influence, and we should always try to find out the real cause.

Causes for Constipation Which Cannot be Reached by Mechanical Methods.—Dr. C. F. Wainwright said that in general he heartily endorsed the views expressed in the paper. There are, however, manifold causes for constipation which cannot be reached by the methods described by Dr. Gant. Especially is such treatment inadequate in those cases which have to do with the circulation, as where there is a vascular stasis on account of obstruction of the portal circulation. The same is true where constipation exists in connection with pulmonary conditions, and particularly tuberculosis of the lungs. Again, it may result from relaxation of the abdominal walls, and here the strapping of the abdomen, as advised by Dr. A. Rose, is often followed by good results in patients who have been constipated for years.

Possible Bad Results from Valvotomy.—The function of the rectal valves is an important one, and it is the duty of physicians to watch the surgeons, so that they may not do harm by cutting. It remains to be seen whether valvotomy may not be followed by injurious results, in consequence of the lack of support thus caused in the rectal walls.

Adrenal Extract May be Valuable in the Treatment of Constipation.—The importance of the ductless glands is now well recognized. When the adrenal functions are suddenly suspended, symptoms are caused which resemble those of Asiatic cholera. In a less degree, bowel symptoms are observed from chronic interference with the functions of these glands, as in Addison's disease, where constipation and diarrhea often alternate. Adrenal extracts may therefore prove very useful in the treatment of constipation.

Are the Rectal Valves the Result of Pathological Changes?—Dr. E. Wallace Lee said Houston's valves assumed importance not only in constipation, but also in diseased conditions of the rectum and anus, such as hemorrhoids, fissure, etc. In such he had often looked for them, and in no single instance had he failed to find them. In fact, he had found congestion and hypertrophy of all the tissues composing the rectum. He was not enough of an anatomist to say whether these valves were a normal feature of the rectum or constituted a pathological condition. Whether they could be strictly called valves or not, he must say that he had never seen any reason to believe that they were anything more than simply folds of thickened mucous membrane.

Constipation a Disease per se.—Dr. Joseph Fraenkel believed that chronic constipation was a disease *per se*. He spoke of its very great frequency in association with neurasthenia and hysteria, and said he had never met with an instance of these in which it was not present. When patients suffering from disease of the heart, lungs or liver came for advice, they did not ask to be treated for their constipation, which was simply incidental. Neurasthenic and hysterical patients, however, applied to the physician expressly to obtain relief from constipation. In these cases he left the nerves alone, and devoted his attention to the intestinal condition. He considered rachitis the great cause of chronic constipation, and said that most rachitical persons were born constipated. Concerning the mentioned hypertrophied valves, he was convinced that these were merely a result of constipation.

Medicinal Treatment.—Dr. L. F. Bishop said he always told his patients, if they did take a laxative, to take it regularly *every* night, and not simply at times when they were particularly constipated. He relied principally upon cascara, and his favorite preparation was an aromatic fluid extract. By its continued use, after a time gradually diminishing the dose, a good many cases were permanently cured, but a good many were not. He thought we must depend largely on moral influence in the treatment—the patient must be trained—and all physicians recognized the importance of measures other than drugs.

The Paper not Surgical.—Dr. Gant, in closing the discussion, said that his paper was by no means intended as a surgical one. In the great majority of cases he depended entirely on the various measures of hygiene to which he had alluded. Resort was had to surgery only in exceptional instances. He had made no attempt to deal with the etiology. He had treated cases of habitual constipation from carelessness on the part of the patient. Reference had been made in the discussion to toning up the intestinal muscular fibres by means of medicines, but he believed that this could be accomplished better by massage and indoor and outdoor exercise.

The Rectal Valves Anatomical.—Valvotomy was sometimes justifiable, but, as he had stated, was not called for as frequently as some enthusiasts would claim. As a matter of fact, he performed the operation oftener in cases of colitis than of constipation. In colitis, by the obstruction which they presented, they not infrequently caused detrimental accumulations of mucus. The valves of Houston, he wished to say, were found to be present in the fetus, in the infant, and at every age throughout life. He felt confident that he could demonstrate them in any individual to the entire satisfaction of the most skeptical. He had never examined the rectum of a patient without finding them. There were usually three valves, but sometimes four, and they passed most of the way around the walls of the bowel. In order to observe them, it was necessary that the rectum should be distended, and they could be readily seen in any individual in the knee-chest position when a proctoscope four inches long was employed. These valves were not simply folds of mucous membrane, but were made up of three coats, the mucous, the fibrous, and the muscular, the latter consisting of both longitudinal and circular fibers.

BOOK REVIEWS.

A COMPEND OF DISEASES OF CHILDREN. By MARCUS P. HATFIELD, A.M., M.D., Emeritus Professor of Diseases of Children, N. W. U. Medical School, Physician to Wesley Hospital, etc. Third edition, thoroughly revised, with a colored plate. P. Blakiston's Son & Co., Philadelphia.

QUIZ-COMPENDS are not much used by progressive students and the compend habit, so-called, is sufficient to stamp a man as one who studies to "get through," rather than to gain knowledge. Yet there are many such books, and if we must have them it is fortunate

to have them so well written as this, which represents a condensation of the author's lectures at the Chicago Medical College. We feel sorry for the children with pleurisy upon whom the author paints Corson's Pigmentum Tiglii until pustules appear, or the infant with colic to whom he administers gin. In general, however, the treatment and symptomatology are well up to date and constitute the most worthy portions of the book. Pathology is not much considered. Infant-feeding is given its share of attention, and as a quiz-compend the book is certainly above the average.

A TREATISE ON DISEASES OF THE ANUS, RECTUM AND PELVIC COLON. By JAMES P. TUTTLE, A.M., M.D., Professor of Rectal Surgery in the New York Polyclinic Medical School and Hospital, Visiting Surgeon to the Almshouse and Workhouse Hospitals. D. Appleton & Company, New York.

THIS is essentially a practical work, intended not to be once read and then cast aside but to be a constantly useful book of reference, full of counsel and assistance in the daily work of any practitioner. Few of the many books that are presented to the medical reader bear evidence of such thoughtful and careful preparation and its perusal is a true pleasure. The character of its teaching is personal to an unusual degree and reflects the experience of a well-schooled observer of long training. The historical and theoretical aspects of the subject have not been neglected and every step in the development of the study of rectal diseases is noted with copious quotations from and reference to the literature together with thorough discussions of etiology and pathology, but still the most prominent feature of the book is its practical utility. This has been achieved not only through the excellence of its matter but also through mechanical execution of a very high order and illustrations which in number and beauty have seldom been equaled in a medical work. Too much praise cannot be given to these, for nearly all are original and being the work of a single artist, form a series most pleasing and valuable in their uniformity and consistency of treatment. The colored plates alone fall somewhat short of what modern presswork leads us to expect and perhaps appear still more at a disadvantage because of the perfection of the black and white drawings.

The author has laid especial stress on examination, diagnosis and local treatment as being the points the general practitioner most needs to know. The symptomatology and differential diagnosis of each condition is given with unusual fulness and wherever non-operative treatment is likely to be of use it is discussed in great detail. Where this is not advised the operative technic is described at length and all the available methods are given, with indications as to the value of each.

Like most specialists, the author has devised a certain number of instruments, chief among which is perhaps his pneumatic proctoscope and sigmoidoscope. These are fully described and in fact the whole chapter on the examination of the lower bowel is particularly interesting, though we cannot agree with the implied freedom from risk attending manual exploration according to Simon, notwithstanding that the author has performed it more than a hundred times without any unfortunate results. The important subject of hemorrhoids is treated with great thoroughness, the author entering a plea for the much-abused injection method in certain selected cases and preferring the clamp and cautery to the ligature for routine use. The chapters on extirpation of the rectum, colostomy, etc., are all sound from the standpoint of the general surgeon and embody the latest methods, such as the use of the O'Hara clamps for intestinal anastomosis.

Every section contains original and progressive views attractively presented and it requires but little prophetic instinct to foresee for it great and lasting success and a place at the head of the literature of the subject.

A SYSTEM OF PHYSIOLOGIC THERAPEUTICS. Edited by SOLOMON SOLIS COHEN, A.M., M.D., Volume V. Prophylaxis—Personal Hygiene—Civic Hygiene—Care of the Sick. P. Blakiston's Son & Co., Philadelphia.

THE present volume is one of the most interesting of this series. It is perfectly true as intimated in the preface that it is an introduction to the Science of Medicine, treating, as it does, especially of the preservation of health and the prevention of disease.

Three different parts are included in this present volume of 516 pages. The first, on the Origin and Prevention of Disease is by Drs. McFarland, and W. W. Babcock. Here are discussed very thoroughly the etiological factors concerned in the production of disease. Immunity, microbic infection, age, sex, heredity, nervous influences, abnormalities of development, auto-intoxications, physical causes, heat, light, cold, electricity, the atmosphere, climate, season, poisons are all thoroughly discussed and their relationships to the general problems of disease outlined. Under the head of sociologic causes, the authors speak of density of population, dissipation, sexual excesses and occupation.

An extremely interesting chapter is on the extrinsic causes of disease in which a thorough handling of the organic factors, those of animal and vegetable origin, is given. The diffusion of disease, infection of vegetables, invasion of the body by micro-organisms are thoroughly treated and there are short chapters on the different diseases due to animal and vegetable parasites.

In Part II, the subject of Civic Hygiene is discussed by Dr. Henry Leffman. It is a very thorough and readable presentation of how a city should be sanitarily policed, what to do with the garbage and sewerage, and full discussions on the subject of plumbing and ventilation. Finally, Part III, by Dr. A. Abrams, discusses individual hygiene and the nursing and care of the sick.

The book is a very thorough one, highly suggestive and extremely practical. It is a worthy addition to an exemplary series.

BOOKS RECEIVED.

REPORT OF THE COMMISSIONER OF EDUCATION. Vol. II. Government Printing Office.

BACTERIA IN DAILY LIFE. By Mrs. Percy Frankland. 12mo, 216 pages. Longmans, Green & Co. New York and London.

PROGRESSIVE MEDICINE. March, 1903. 8vo, 450 pages. Illustrated. Lea Brothers & Co. Philadelphia and New York.

THE INTERNATIONAL MEDICAL ANNUAL. 1903. demi 8vo, 739 pages. Illustrated. E. B. Treat & Co. New York and Chicago.

PROCEEDINGS OF THE AMERICAN MEDICO-PSYCHOLOGICAL ASSOCIATION. Fifty-eighth Annual Meeting. 8vo, 333 pages. Illustrated.

LES OBSESSIONS ET LA PSYCHASTHENIE. By Drs. F. Ramond and P. Janet. Vol. II. 8vo, 543 pages. Illustrated. Felix Alcan. Paris.

TRANSACTIONS OF THE AMERICAN OPHTHALMOLOGICAL SOCIETY. Thirty-eighth Annual Meeting. 8vo, 686 pages. Illustrated. Hartford, Conn.